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TABLE OF CONTENTS, PAGE II

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CONTENTS

General Articles

Diseases of Swine Due to Nutritive Deficiencies—H. C. H. Kernkamp 373

3,000 Wild Bird Autopsies on Western Lake Areas—E. R. Quortrup and J. E. Shillinger 382

The Susceptibility of Dogs to Virus of Equine Encephalomyelitis (Western)—Carl F. Schlotthauer 388

The Value and Relative Effectiveness of Preparations of Rotenone, Derris Powder and Cube Powder as Larvicides for Cattle Grubs—C. E. Smith, Elmer Livengood and Irwin H. Roberts 391

Surgery and Obstetrics (and Problems of Breeding)

Retained Placenta—M. G. Fincher 395

A New Technic in Conchal Hematoma of the Dog 404

A Further Note on Diagnosis and Treatment of Bovine Trichomonas Infection—W. M. Swangard 404

Prolonged Artificial Respiration 406

A Laudable Departure in Horse Breeding 406

Clinical Data

Clinical Notes 407

Treatment of Percheron Horses for Gastrointestinal Parasites with a Phenothiazine-Carbon Disulfide Mixture—L. E. Boley, N. D. Levine, W. L. Wright and Robert Graham 408

Eggs in Food Inspection 411

The First Stopping Place of Liquid Drugs Given to Ruminants 412

(Continued on page iv)

Officers: H. W. Jakeman, *President;* W. W. Dimock, *President-Elect;* J. G. Hardenbergh, *Executive Secretary;* M. Jacob, *Treasurer.*

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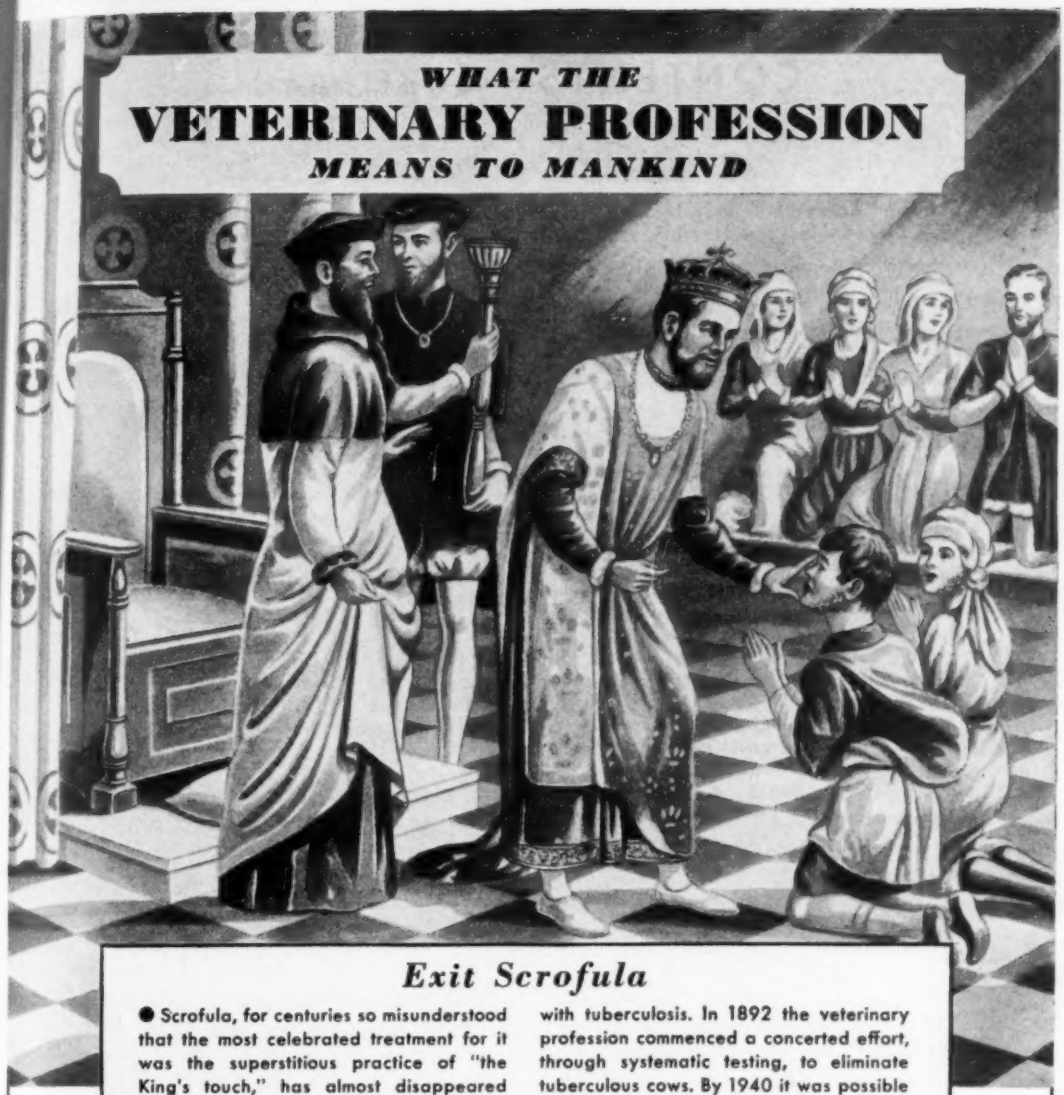

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CONTENTS—Continued

Clinical Data—Continued

An Extended Study of Female Offspring of Positive Bang's Diseased Cattle—C. P. Fitch, W. L. Boyd, Margaret D. Kelly and Lucille M. Bishop 413

Occlusion of Mesenteric Arteries in the Horse 414

Methenamine in Tetanus 415

"Salt Treatment" for Enteritis in Hogs 415

Editorial

The Beef of Argentina 416

Cashing in on Hungry Mouths 418

Foreign Veterinary Journals 418

Two-Party System for the AMA 419

"The Cattleman" for September 1941 419

Current Literature

Abstracts: Equine Encephalomyelitis in a Prairie Chicken, 420; Wood Tick Vector of Equine Encephalomyelitis Virus, 420; St. Louis Encephalitis Akin to Equine Encephalomyelitis, 420; Artificial Insemination of Pigeons and Doves, 420; Cows' Urine as Fertilizer for Pastures, 420; Primary Encephalitides, 421; Phenothiazine in Horses, Cattle and Pigs, 421; The Possession of Dogs, 422; Canine Tuberculous Septicemia, 422; Coccidioidmycosis in the Dog, 422; Disinfection of Hides, 423; Some Facts About the Sheep Head Grub (Oestrus Ovis), 423.

Book Notices: Handbook of Communicable Diseases, 423; Was It the Feed?, 424; Poultry Diseases and Parasites, 424.

The News

AVMA Activities 425

Applications 426

U. S. Government 427

Among the States 429

Coming Meetings 433

Personal Notes 434

Deaths 434

Committee Reports, Seventy-Eighth Annual Meeting

Education, 435; Rabies, 438; Biological Products, 438; History, 439; Interstate Shipment of Livestock by Truck, 440; Veterinary Participation in National Defense, 440; Parasitology, 441; Public Relations, 442; Proprietary Pharmaceuticals, 444; Bang's Disease, 446; Nomenclature of Disease and Vital Statistics of Domestic Animals, 447; Legislation, 447; Poultry Diseases, 448; Resolutions, 451; Representative to the Horse and Mule Association of America, 452; Representative to the National Research Council, 453; Representative to the American Association for the Advancement of Science, 454.

Miscellaneous

Trichinosis a Political Question, 381; Eastern Equine Encephalomyelitis in the 1850s, 390; Nitrogenous Constituents of Normal Dogs' Blood, 390; Protein-Carbohydrate-Fat, 394; Salaries of Bureau Veterinarians, 454.

An' Related Topics ..... *xvi*

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Diseases of Swine Due to Nutritive Deficiencies*

H. C. H. KERNKAMP, D.V.M., M.S.
St. Paul, Minn.

THE DISEASES OF swine are many, and not the least among them are disorders associated with metabolism and nutrition. The veterinarian is often called upon to prescribe for swine in which a greater or lesser number in the drove are suffering from an insufficient supply of one or more of the nutritive essentials.

The dysfunctions and disorders generally included in the category of nutritive deficiencies are those resulting from either a partial or complete deprivation of certain minerals and vitamins. We would add to this the conditions brought about from a lack in quantity or quality of such nutritive necessities as protein, carbohydrate, fat and water.

WATER

Water is an essential nutritive element. Pathologic disturbances with morbid potentialities will result when more than 10 per cent of the water of the body is lost. It is well to remember that more than 60 per cent of the body weight is water. Dukes[1] summarizes the function of water as ". . . a necessary part of protoplasm; . . . a medium for the transfer of dissolved nutrients to the cells and for the removal of waste products from the cells; . . . concerned in temperature regulation in the body; . . . a lubricant to body surfaces. . . ." The specific water requirements vary and depend upon the age and size of the pig, the succulence of the foodstuffs consumed, the period of gestation and lactation, and upon factors which govern its elimination from the body. According to Morrison,[2] the amount of water consumed daily ranges from approximately 1.5 gal. per 100 lb. of animal at weaning time to 0.5 gal. per 100 lb. of live weight during the fattening period. Garver and Sanders[3] report an average daily intake of 5+ gal. per sow, which is the result of measurements on a large series of brood sows and covers a period from one week before and six weeks after farrowing. These data give some idea of the quantities of water that swine will consume if given the opportunity.

While the number of cases of total water deprivation would be small, the instances in which an insufficient water intake occurs are not uncommon. The seriousness of a total deprivation of water is appreciated by the husbandman, but the

*Paper No. 1838, scientific journal series, Minnesota Agricultural Experiment Station; contribution from the Division of Veterinary Medicine. Presented before the Section on General Practice at the seventy-seventh annual meeting of the AVMA, Washington, D. C., August 26-30, 1940.

[1]Dukes, H. H.: The Physiology of Domestic Animals (Comstock Publishing Co., Ithaca, N. Y., 4th ed., 1939), p. 432.

[2]Morrison, F. B.: Feeds and Feeding (The Morrison Publishing Co., Ithaca, N. Y., 20th ed., 1937), p. 828.

[3]Garver, F. H., and Sanders, H. C.: J. Agr. Sci., xxvii (1937), pp. 638-643.

provision of a sufficient amount may not impress him as being especially significant.

The clinical manifestations and necropsy findings in inadequate water consumption *per se* are not especially pathognomonic. The signs which should direct attention to a condition of this kind are those characteristic of inanition, cachexia and dehydration. There is much evidence of loss in body weight; the hair coat is dry, harsh and coarse; the skin is dry and sometimes wrinkled; skeletal prominences are observed; and the eyes are sunk deep in the orbits. Pigs in this condition often produce a pitiful cry or squeal and go about as if in search of something they greatly desire. While symptoms of this sort are suggestive of water starvation, the diagnosis depends more upon factors reached by the process of elimination. When no other gross nutritive, microbic, viral or parasitic factors are involved, and an inspection of the premise reveals facts suggestive that the water supply is inadequate, then a diagnosis of water deficiency is more certain.

It is well to remember that swine will live longer without food than without water.

PROTEIN

Protein deficiencies in swine are not uncommon, although the condition seldom reaches the proportions of a disease with morbidity and mortality characteristics. Many cases of chronic malnutrition are traceable to an inadequate protein intake. The importance and value of protein for the purposes of maintenance and growth are not appreciated by many husbandmen. Most of the work on the economy of pork production emphasizes the need of adequate protein supplements in the diet, both from the standpoint of quantity and quality. The quality or biologic value of proteins depends upon their amino-acid content. The amino acids most essential for maintenance and growth appear to be lysine, tryptophane, histidine, phenylalamine, leucine and methionine. In general, these amino acids occur in greatest abundance in tankage, meat scraps, blood meal, fish meal and milk.

The services of the veterinarian are seldom sought where a protein deficiency exists until the owner or feeder comes to the realization that his pigs are not growing and increasing in weight in accordance with his anticipations. In his opinon the state of malnutrition, so evident in the pigs, is the result of some insidious disease.

The clinical and postmortem pictures of protein deficiencies in swine are not especially characteristic. The physical manifestations are usually those suggestive of malnutrition. The affected pigs are more or less emaciated, undersize and underweight. The skin is dry and harsh and the hair coat dry, dull and shaggy. The appetite is diminished and the animals move about in a languid, sluggish manner, as if disinterested in their existence. Evidences of edema or "stocking" of the legs may occur in some cases, and occasionally one will encounter symptoms of ascites. The postmortem appearance of cadavers suffering from low protein intake usually shows an absence of fat, and the skeletal muscles are dark and atrophic. The visceral organs, especially the liver, heart and thyroid glands, are more or less atrophied. Hydropericardium, hydrothorax and ascites are other gross findings not infrequently seen at autopsy.

While the symptoms and postmortem findings are of considerable value in establishing the diagnosis, the most valuable points will be gleaned from the history. When this shows that the quantity and quality of the protein intake is inadequate, the diagnosis of protein deficency can be more firmly established. It is often difficult to convince an owner or caretaker that the principal cause of the poor condition of his pigs is a protein deficiency. This seems too simple to him; he much prefers that some more complex condition be responsible for the situation.

The therapeutic and corrective procedures to follow bear a close relation to the primary cause, namely, to supply the deficiency. Complete recoveries often occur, especially in those cases that have not progressed to the point where a failure to respond to the growth impulse exists. Milk,

dry-rendered tankage or fish meal will provide the necessary deficiencies in most cases.

CARBOHYDRATE AND FAT

Disorders and disturbances resulting from deficiencies of carbohydrates and fats are not likely to occur in swine, since practically all rations fed this class of livestock supply enough of these important nutrients. It is generally accepted that the carbohydrates are readily changed into fat and other essential lipids in the body, and in the same way, to some extent at least, certain of the lower fatty acids may be converted to carbohydrate.

INORGANIC ELEMENTS

Generally speaking, the diseases of swine due to nutritive deficiencies are those resulting from insufficient intakes of certain inorganic elements and vitamins. The inorganic elements most likely to be deficient in the dietaries of swine are calcium, iron, copper and iodine. Vitamin A, vitamin D and certain fractions of the vitamin B complex represent the organic dietary constituents of this class that might be lacking in the diets of swine. There are, of course, other inorganic elements and vitamins essential to the life of swine, but the probability of the diet being short in them is more remote.

Calcium, phosphorus and vitamin D are all vitally important to the health and economy of swine. Since they are so closely related functionally, it seems advisable that they be discussed collectively.

Calcium and phosphorus, in addition to being necessary constituents of bone, are also essential components of blood and other body fluids, where they exert effects upon acid-base equilibriums, osmosis and muscle-nerve irritability. Vitamin D functions to help make these minerals more assimilable and available. A very definite relationship exists between vitamin D and sunlight. Through the medium of the ultraviolet rays of sunlight, certain substances in the body known as precursors are, by irradiation, transformed into vitamin D. In the temperate zone these rays are more potent in summer than in winter, and they are more potent at noon than in the morning or evening. It is important to remember that there are fewer days of sunshine in the winter and that ultraviolet is screened out by ordinary window glass.

Rickets and Osteomalacia.—Rickets and osteomalacia are two of the principal diseases associated with disturbances of mineral and vitamin D metabolism. Rickets is a disease of the young and growing pigs, while osteomalacia usually occurs in older swine. In the former a failure of the normal calcification occurs, whereas in the latter the mineral elements are removed from the already calcified bone.

Locomotory disturbances constitute the principal clinical manifestations of rickets and osteomalacia. An early and suggestive sign of rickets will often be seen when the pig is standing and eating or drinking at a feeder or waterer. One or more feet are lifted from the ground and set down again at frequent intervals. This is indicative of pain. Later in the course of the disease the gait becomes stilty and stiff, and in the more advanced stages recumbency is preferred. When such animals are forced to rise and move about, they crawl, using their carpi ("knees") as a fulcrum and then dragging the hind legs. In extreme cases the extremities of the long bones enlarge, thus making the joints appear large. Secondary articular disease often occurs in the protracted cases, causing the pig much pain when standing or moving. Fractures are not uncommon.

Osteomalacia, as stated previously, occurs more often in older swine. Many of the cases of so-called posterior paralysis, lactating paralysis and sow paralysis in adult swine are, in my opinion, cases of osteomalacia. The symptoms displayed by swine suffering from this syndrome are similar to those described for rickets. In the North Temperate zone it is observed more frequently in the spring season. This, it appears, is due to the fact that the animals receive less vitamin D either directly or indirectly during the winter season. Sows nursing large litters often show the symptoms of osteomalacia, particularly where no special effort is made to supply

them with calcium and vitamin D. Its more frequent occurrence in pregnant and lactating sows is due to the fact that the calcium is removed from their skeletal system and transferred to the developing fetuses or is secreted in the milk for the benefit of the suckling pigs.

Severe calcium deficiencies in pregnant sows often result in the birth of dead or weak pigs, and the milk supply for the pigs is markedly reduced.

The gross lesions when pathologic changes are evident are confined principally to the osseous and articular structures. The changes in the bones, unless they are misshapen or fractured, are not especially noticeable. In the more severe cases and when articulations are involved, some striking lesions will be observed. The joints that usually show lesions are the scapulohumeral (shoulder), cubital (elbow), coxae (hip), and genu (stifle) joints. The articular cartilages may be thrown into folds or wrinkles, and often deep, erosion-like changes occur which extend to the underlying bone. Much fibrous tissue surrounds the joint, and the synovial membrane is usually thickened with small tags or shreds attached to its surface. The underlying bone is generally very soft and can easily be cut and broken away. In fact, by striking the epiphysis of the long bones a light blow with the cutting edge of a heavy postmortem knife, it can be made to "sink in" quite readily in poorly calcified bones.

The treatment and method of handling of rickets and osteomalacia are quite satisfactory. The results that can be expected depend largely upon the extent or stage of the disease and upon the coöperation of the owner or caretaker. The important thing in connection with the treatment is to remove the cause. In this case it means that the deficiency or deficiencies be supplied. Steamed bone meal is a satisfactory source of calcium, although calcium carbonate and ground limestone (of low magnesium content) are equally valuable. These should be added to the ration at the rate of approximately 3 or 4 lb. per 100 lb. of other feed. Cod liver oil is an excellent source of vitamin D, and it should always be incorporated in the diet. Cod liver oil is to be fed at the rate of approximately 10 to 15 cc. per 100 lb. of pig and the affected animals allowed to obtain the benefits of sunshine whenever possible. When sows that are suckling a litter of pigs are affected, it is advisable to wean the pigs, unless they are still too young to receive supplemental nourishment.

Tetany.—A syndrome marked by tetanic muscular contractures frequently occurs in young pigs between the ages of 3 and 10 weeks. We speak of this syndrome as tetany. The cause of tetany, we believe, is directly related to an abnormal metabolism of the ionizable calcium and phosphorus of the blood, resulting in a state of hyperirritability at the nerve endings in skeletal muscle. The primary or underlying factor in the etiology of this disorder is a dysfunctioning parathyroid gland.

The disease is sporadic rather than enzoötic, since only one pig in the litter or litters may be affected. In our experience, the disease occurred in pigs that were farrowed and kept outdoors about as often as it did in those farrowed and kept indoors. The symptoms are well marked and consist chiefly of muscular contractures which are observed best when the pig walks or runs. The contractures occur intermittently or they may be persistent, and the muscles of the limbs are involved in most cases. Very often after advancing several strides the animal topples over because the contractures become so marked as to cause fixed flexion of the joints. This may continue for two or three minutes or only momentarily. Death is not imminent.

From the standpoint of therapy, the rational procedure would be to administer parathyroid hormone, since it has been shown that the products of the parathyroids play an important part in calcium metabolism. The object in this case is to cause a mobilization of the calcium. Good results have followed the administration of cod liver oil and syrup of calcium lactophosphate—one-half teaspoonful of the oil and 4 or 5 cc. of the lactophosphate daily. Intramuscular injections of calcium glu-

conate, 5 to 10 cc., appear to be beneficial in some cases.

Nutritional Anemia.—There is great need in the body for iron and copper. Iron, in addition to its important rôle in the formation of hemoglobin, also functions as a catalyst in the oxidation processes of body cells. The function of copper appears to be concerned with the synthesis of hemoglobin.

The probability of these elements being deficient in the diets of swine that are past the suckling stage is slight, unless they are restricted to foodstuffs grown in geographic areas or regions where the soil is poor in these elements. On the other hand, there is a great probability that suckling pigs that are obliged to live under conditions where they can not obtain iron and copper will suffer from the deficiency.

Nutritional anemia is characterized chiefly by a decrease in hemoglobin and in numbers of red blood cells per unit volume of blood. The decreases are often so great that the life of the pig is in danger. Secondary changes, such as pulmonary edema, hydrothorax, ascites and gastrointestinal disturbances, often accompany the anemia and produce serious results. Infections that produce ulcerative and necrotic lesions about the mouth, nose and skin usually become extensive in anemic pigs.

The circumstances and conditions which favor the onset and progress of this disease in suckling pigs are those which preclude their access to iron and probably copper. In piggeries where this disease occurs it will be found as a rule that the baby pigs are spared the opportunity of access to soil during the first two or three weeks of their lives. Soil usually contains the elements effective toward maintaining normal blood.

The clinical picture of pigs suffering from nutritional anemia is characteristic. The body is plump and stocky, especially about the neck and shoulders. In fact, the skin over these regions lies in folds or wrinkles. The pigs have a slightly dull and listless attitude, and they often shake and shiver as if chilled. The visible mucous membranes are pale and bleached. Respiratory symptoms frequently consist of thumpy, jerky, diaphragmatic excursions. Dyspnea and sometimes moist rales are heard. Many affected pigs have watery stools. An examination of the circulating blood gives the most valuable information. Here the changes characterizing the disease are an oligochromemia (decrease in hemoglobin) with hemoglobin values of 6 or less grams per 100 cc. of blood by volumetric standards, or 60 per cent or less by colorimetric standards. Numerical counts of the red blood cells give values of 3,500,000 or less cells per cubic millimeter.

The postmortem findings in well-marked cases are usually distinctive. The blood is thin and pale. The serous cavities contain comparatively large quantities of straw-colored fluid, which frequently undergoes a fibrinous organization. The heart is enlarged, pale and soft. The liver is enlarged, very friable and mottled. Edema of the lungs is found in many pigs dying from this disease. The subcutaneous tissues are watery, typical of the condition known as anasarca.

In connection with the control and treatment of this disease much valuable assistance can be given. Solutions of iron and potassium tartrate or iron and ammonium citrate in doses of 2 gr. per day for pigs 2 or 3 weeks of age and 3 or 4 gr. per day for older pigs are a rational therapeutic procedure. Pills made with reduced iron in 1-gr. doses can be dispensed for very young pigs and 2 or 3 gr. for older ones. It is always advisable to allow the pigs access to soil, and in order to fortify it with more iron a solution of iron sulfate (1:1,000) can be sprinkled on it. About 15 to 20 cc. sprinkled over a shovelful of soil each day is sufficient in most cases. The syndrome can be controlled by providing soil for the young pigs to consume, beginning when they are 4 or 5 days old. It is a good plan to place 2 or 3 lb. of clean soil in the pen with the suckling pigs each day. When pigs are old enough to consume food other than their mother's milk, the period of preventive or curative therapy can be discontinued. It is seldom necessary to supply copper, since usually enough of this element

is present as an impurity in the other chemicals used.

Iodine Deficiencies.—Iodine deficiencies in swine are recognized primarily by the birth of dead or weak and hairless pigs. The bodies of the fetuses appear swollen and the skin and subcutaneous tissues edematous. If born alive, they usually succumb within several hours. The iodine deficiency syndrome must be prevented. This can be done by feeding iodine to the pregnant sow. Sodium or potassium iodide in doses of 1 or 2 gr. daily for the first 90 to 100 days of pregnancy will suffice. Iodized salt will supply enough of this element to assure against losses from the deficiency.

The problem of iodine deficiency is not widespread. It is a regional problem. In this country the territory in which the soil is low in iodine is the Great Lakes and Northwest regions particularly. Foodstuffs grown in this area and also the water are usually low in iodine.

VITAMINS

The importance of vitamins as dietary essentials is well recognized. Discoveries of different organic substances comprising them are steadily increasing. Considerable evidence has accumulated to show the necessity of some of the vitamins for swine, but much less is known with respect to others. It is difficult to construct diets for swine that are sufficiently deficient in some of the vitamins so that a critical evaluation of their requirements and effects can be made. It is to be expected, however, that with the purification and synthesis of these substances a greater and more definite knowledge of their value in swine will be obtained.

Vitamin A.—Although the specific requirements for vitamin A in swine under conditions of health and disease are incomplete, there are numerous examples which show it to be necessary in their economy. Like most of the other vitamins, it is essential to growth. Other important functions of vitamin A concern the processes of maintaining normal epithelial structures and, in some degree at least, the physiologic status of nerve tissues. It is not known just how these processes take place.

About the first pathologic condition in swine now attributed to a deficiency of vitamin A is a syndrome marked by a locomotory disturbance. In 1922, Golding, Zilva, Drummond and Coward[4] reported having observed a locomotory disturbance in pigs that were receiving a diet low in vitamin A. Their description of the clinical signs of disease was meager, merely stating that in the words of a practical swine husbandman, the affected pigs were "off their feet." These workers were quite positive in asserting that the condition was not rickets, the disease they were then investigating. Several years later Hughes, Aubel and Lienhardt[5] called particular attention to a striking incoördination of the locomotory activity of pigs subsisting on vitamin A-deficient rations. They found that a fatty degeneration of the femoral and sciatic nerves and of certain areas of the spinal cord had occurred in the affected pigs, which served to explain the locomotory symptoms. The symptoms were not distinct until late in the course of the experiment. They state that an average of 219 days on the vitamin A-deficient diet was required before distinct signs of incoördination were seen. A more complete clinical picture of the syndrome is given by Elder.[6] Locomotory incoördination, he says, is the most striking clinical sign. When walking, the hind feet are raised high and carried well forward in rapid succession, resulting in a jerky, "stringhalt" gait. Another characteristic action is the movement with the hind feet in which the foot is carried forward and then very quickly carried laterally and across the fixed leg, or in still other cases the hind foot is lifted from the ground and then a quick backward kick is produced. Not infrequently a "knuckling over" at the pastern and coronet occurs, and short, stilty strides with the front feet are common.

[4]Golding, J., Zilva, S. S., Drummond, J. C., and Coward, K. H.: Biochem. J., xvi (1922), pp. 394-402.

[5]Hughes, J. S., Aubel, C. E., and Lienhardt, H. F.: Tech. Bul. 23, Kansas Agr. Exp. Sta. (1928).

[6]Elder, C.: J.A.V.M.A., lxxxvii (1935), pp. 22-30.

Many times they will move about using the knees as a fulcrum.

The investigations of Hughes *et al.* indicate that a deficiency of vitamin A in female swine of breeding age may result in certain reproductive disorders. Some sows on vitamin A-deficient rations appear to come in estrus much more frequently than normal, but will not accept coitus. In the cases where conception occurred, either abortion took place or the fetuses delivered at term were dead. One of the pregnant sows on the vitamin A-deficient diet was slaughtered on the eighty-first day of gestation and inspection of the uterus revealed six partly resorbed fetuses. These results direct attention to the fact that reproductive disorders may occur when the ration fails to supply sufficient vitamin A. Some of the respiratory disturbances frequently seen in young pigs may be related to a lack of vitamin A. It has been shown that a keratinizing metaplasia of epithelia develops in infants receiving food low in vitamin A, and it is possible that similar changes occur in young swine.

Vitamin A and the substances that can be converted into vitamin A in the body (alpha, beta and gamma carotene and cryptoxanthin) occur quite abundantly in whole milk, yellow corn and green, leafy pasture plants, and also in more concentrated amounts in cod liver oil. Still other sources of vitamin A are liver, carotene concentrates and cod liver oil concentrates.

The prevention and treatment of avitaminosis A requires that this vitamin be supplied. The form in which it is supplied is not important, but it is generally advisable to permit the affected animals to run in green pasture whenever possible. Pasturing can be supplemented by adding cod liver oil or other vitamin A concentrates.

B Complex.—The vitamin B complex, as it is frequently called, has been the object of much investigation since 1926, when it was learned that the original vitamin B was not a single entity. The B complex, according to the present concept, is composed of several factors: B_1, or thiamin; B_2, or riboflavin (sometimes referred to as vitamin G); B_3, or erosion factor; B_4, or rat-paralysis factor; B_5, or pigeon-weight factor; B_6, or rat-acrodynia factor; W, or rat-growth factor; and nicotinic acid. It is not unlikely that still other components will be discovered. With this array of substances it is easy to understand the significance of the term B complex.

From the standpoint of the deficiency diseases of swine that have a relationship to the B complex, the situation is no less complicated. As a matter of fact, the clinical and pathologic findings associated with deficiencies of these several components in swine have not been completely investigated. At present it appears that some of the components are specific for only certain animals and are not essential in swine.

B_1, or Thiamin.—An important physiologic function of thiamin is its participation in reactions involving carbohydrate metabolism. It enters into the decarboxylation and oxidation of pyruvic and lactic acids in the brain, heart and other tissues. The neurologic and circulatory symptoms characterizing thiamin deficiency are believed to be referable to a failure of these reactions to occur. Thiamin is also being credited with a function to regulate secretions in the gastrointestinal tract.

It seems reasonable to regard thiamin deficiencies in swine as of very uncommon occurrence. The basis for this assumption is that the foodstuffs most pigs receive would supply this important nutrient. Whole-cereal grains and pasture grasses are excellent sources of thiamin, and they constitute the major part of the dietary regimen of most swine. There is also little chance that garbage-fed pigs would be deficient in thiamin, for it occurs in leafy vegetables, uncooked liver, kidneys, egg yolks and some of the citrus foodstuffs, and garbage usually contains one or more of these materials. Brewer's yeast is another excellent source of thiamin, and whenever this forms part of the ration a deficiency should not result.

Clinical thiamin deficiencies have been mentioned as an entity in swine. The symptoms characterizing it are not definite, but include incoördination and paralysis. In fact, the symptom complex appears to be quite similar to that in vitamin A deficiency. It is entirely possible that a critical study of vitamin A and B_1 deficiencies in swine may show them to be concomitant etiologic factors in connection with the neurologic disorders credited to the absence of these vitamins.

Vitamin B_2, or Vitamin G, or Riboflavin.—The effects of riboflavin deficiencies are best known from studies with laboratory animals.

In young chickens a marked flexion of the toes ("curled toes") is a characteristic symptom of riboflavin deficiency, and in turkeys a dermatitis results when this vitamin is lacking in the diet. In rats a deficiency of riboflavin inhibits growth and the hair falls out in patches. In man riboflavin deficiency results in a disease of the commissures of the lips, in which the epithelium becomes denuded and fissures or creases occur. Specific indications of riboflavin deficiency in swine have not been determined.

Vitamins B_2, B_4, B_5, B_6 and W.—Diseases in swine which might result from a deficiency of any one of this group of nutrient factors would be well within the category of speculation. There is no concrete evidence to show that a lack of any of them results in disease in this class of livestock. Positive knowledge of their worth in swine must be left for further study.

Nicotinic Acid.—Nicotinic acid appears to be of considerable importance in the nutrition of swine. When rations are fed in which much effort is made to deprive animals of this substance, it is found that growth comes to a standstill, intestinal disorders become manifest and the general physical condition becomes poor.

Birch, Chick, and Martin[7] in England, Hughes[8] and Davis, Freeman and Madsen[9] in this country have made special studies of the nicotinic acid problem in swine. Hughes reports that when nicotinic acid was added to the diets of pigs that had been receiving rations in which it was deficient, there was remarkable improvement in the rate of growth, the hair coat became sleek, the general well being of the pigs increased and the amount of food consumed per pound of body weight was reduced. According to Birch *et al.*, young pigs that were obliged to feed on rations deficient in nicotinic acid developed a condition which they describe as being similar to necrotic enteritis. At the same time other lots of pigs receiving the same ration plus dried yeast could be reared successfully. Davis, Freeman and Madsen noted that the appetites of pigs on nicotinic acid-deficient diets were poor, and subsequently the physical condition became poor. When nicotinic acid was supplied, the appetites improved as did also the physical status.

The observations of these and other workers suggest a relationship between a deficiency of nicotinic acid in the diet and the occurrence of an enteric disease. It is the opinion of some that the deficiency is a primary or contributing factor in the cause of necrotic enteritis and that microörganisms play the secondary rôle. Madison, Miller and Keith[10] report an interesting experience with the use of nicotinic acid in a relatively large group of pigs said to be affected with necrotic enteritis. To the ration the pigs had been getting—corn, oats, wheat middlings, tankage and a limited amount of skim milk—they added 50 mg. of nicotinic acid per pig per day and found that after twelve days of treatment there was marked improvement. Chick, Macrae, Martin and Martin[11] had a similar experience with two pigs that were exhibiting symptoms of an enteric disease. They injected 100 mg. of nicotinic acid into the muscle once each day for three days and noted within 24 hours a marked improvement in general condition and attitude toward food. The treatment was continued another five or six weeks, with 60 mg. of the nicotinic acid per pig per day mixed in with the food. Complete recovery resulted. Remarkable curative and preventive results with nicotinic acid in necrotic enteritis are reported by Davis, Freeman and Madsen. This was obtained with liver, yeast and purified nicotinic acid.

These observations and results are both interesting and encouraging, but the time has not yet come when we can accept without reservation that this particular food substance has a major rôle in connection with the diseases that we now include as an "enteritis syndrome." We have records of many cases of "necrotic" enteritis in which it appears that the pigs received an adequate intake of nicotinic acid. A full discussion of this matter must be deferred to some subsequent time.

Nicotinic acid has been found to occur in milk, tankage, liver, yeast and to some extent in cereal grains and grasses.

Other Vitamins.—It is the opinion of most persons who have studied the vitamin C or ascorbic acid requirements of domestic animals that this vitamin is readily synthesized in the body and that it need not be added to the diet. Recently, however, Phillips[12] announced that under certain dietary regimens, cattle do not synthesize all of the ascorbic acid necessary for normal functions. It is suggested that an insufficient ascorbic acid supply is in some way related to reduced reproductive activity, especially in males. He reports marked beneficial effects in reducing and overcom-

[7]Birch, T. W., Chick, H., and Martin, C. J.: Biochem. J., xxxi (1937), pp. 2065-2079.

[8]Hughes, E. H.: Hilgardia, xi (1937-1938), pp. 595-612.

[9]Davis, G. K., Freeman, V. A., and Madsen, L. L.: Tech. Bul. 170, Michigan Agr. Exp. Sta. (1940).

[10]Madison, L. C., Miller, R. C., and Keith, T. B.: Sci., lxxxix (1938), pp. 490-491.

[11]Chick, H., Macrae, T. F., Martin, A. J. P., and Martin, C. J.: Biochem. J., xxxii (1938), pp. 10-12.

[12]Phillips, P. H.: J.A.V.M.A., xcvii (1940), pp. 165-166.

ing impotency in bulls when given a course of treatment with ascorbic acid. Subcutaneous injections of 5 mg. of ascorbic acid per kilogram (2.2 lb.) of body weight every three or four days and continuing for five or six weeks are recommended by Phillips. While nothing specific is known in respect to its use in swine, nevertheless the results warrant giving the ascorbic acid treatment a trial on impotent and slow-breeding boars.

Vitamin D was discussed in connection with calcium and phosphorus deficiencies.

It has not been shown that vitamin E deficiencies occur in swine living under ordinary farm conditions. This, no doubt, is due to the fact that vitamin E occurs in many of the foodstuffs consumed by swine. It is abundant in cereals, especially the germ parts of them, and in green forage. A concentrated source of vitamin E is wheat germ oil.

Little or nothing is known with respect to the needs of swine for vitamin K, the so-called antihemorrhagic factor. Occasionally one hears of the possible association of vitamin K and so-called bloody dysentery of swine, but as yet there are no critical data to support that view. Vitamin K is found in leafy vegetables and alfalfa and to a less extent in milk and cereals.

SUMMARY

1) Disorders and dysfunctions in swine due to nutritive deficiencies have an important place among diseases of swine.

2) Deficiency diseases are generally enzoötic. In droves where diseases of this kind occur, it will be found, as a rule, that a large proportion of the pigs are affected. The disease is usually represented in its several different stages or phases.

3) Generally, disorders resulting from food deficiencies have a slow onset and run a chronic course.

4) The mortality from deficiency diseases is low. Where death occurs in pigs suffering from food deficiency, it is generally because some concomitant disease supervened.

5) Deficiency diseases are preventable. However, curative and restorative therapeutic procedures produce satisfactory results in many instances. Whenever treatment can be begun early in the course of the disease, the results will be more successful.

6) Specific therapy for specific deficiencies is imperative.

7) The case history is frequently of greater value from the standpoint of diagnosis than the clinical and postmortem findings.

8) Many of the ailments of swine ascribed to specific nutritive deficiencies are still in the realm of speculation and await confirmation through carefully controlled investigation and research.

Trichinosis a Political Question

"As soon as it becomes politically feasible," says *The Journal of the American Medical Association*,* "complete elimination of infected pork is possible in American markets."

In leading up to this conclusion, the editor points out the extent to which the incidence of trichinosis has been curtailed in swine on the Pacific Coast and in Canada by controlling rats and cooking garbage fed to hogs. The reports of McNaught and Zapater (1940), of McNaught and Anderson (1936) and of Cameron of Canada are cited to illustrate what can be done toward exterminating this menace to American animal production. It is not pleasant to have "political feasibility" as a means to a public health end, but there it is for the veterinary profession to handle.

The foot-and-mouth disease outbreak in Eire, as of July 1941, cost more than $1,000,000 and led to the slaughter of 20,000 cattle together with many sheep and hogs.

Better than meatless days is to raise meat-producing animals. It has been said that the meatless days of the first World War led to a decline in *per capita* consumption of meat for some years.

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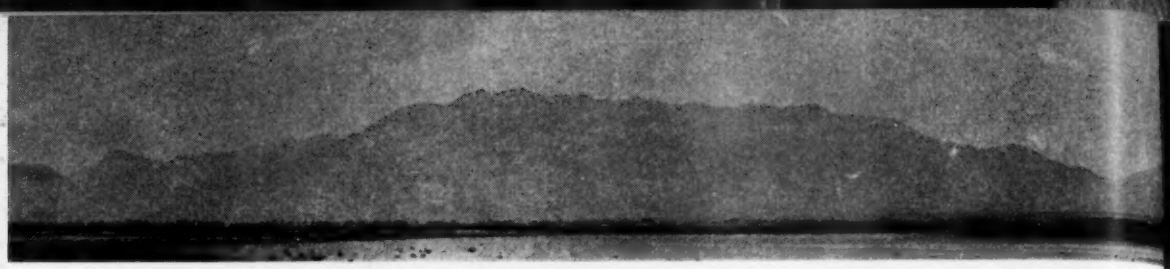
*Editorial, J.A.M.A., cxvi (June 28, 1941), p. 2855.



3,000 Wild Bird Autopsies on Western Lake Areas*

Shoreline of a western lake during an outbreak of botulism in wild waterfowls.

E. R. QUORTRUP, D.V.M.
and J. E. SHILLINGER,
B.S., M.S., D.V.M.

DURING FOUR YEARS of wild-life-disease research, which has dealt primarily with botulism of waterfowls, as many autopsies as time and opportunity would permit have been performed. We shall in the following discussion consider the first 3,000 postmortem examinations made at the Bear River Wildlife Disease Research Station during the period 1937 to 1940, inclusive.

It should be stated at this time that inasmuch as the autopsies performed were made incidental to and supportive of special investigations, a complete pathologic record of each case is not included. At times the investigators were searching especially for lesions produced by botulism, at other times lead poisoning was the special object of study and, consequently, conditions which possibly might have been of academic interest may have been overlooked. No attention has been given to ectoparasites, and the study made of endoparasites is not complete.

The first analysis of our findings deals with the frequency of various diseases. A check on our postmortem records reveals the figures shown on the next page.

BOTULISM

The only fairly constant lesions found by the authors in botulism, or western duck sickness, are petechiation of the heart wall involving the epicardium and the superficial myocardium and a general congestion of the smaller blood vessels. This is especially noticeable in the brain, where rupture of the capillaries is not uncommon. Petechiation of the heart occurs in approximately 75 per cent of the cases examined in birds brought in from the field, as well as in cases

*From the Fish and Wildlife Service, U. S. Department of the Interior, Brigham, Utah, and Washington, D. C.; presented before the Section on Poultry at the seventy-eighth annual meeting of the AVMA, Indianapolis, Ind., August 11-15, 1941.

Disease	*No. Cases*	*Per Cent*
Botulism	1,467	47.9
Mechanical injury, including gunshot	556	18.5
Lead poisoning	259	8.6
No diagnosis and miscellaneous	144	4.8
Pneumonia	113	3.7
Parasitism	101	3.3
Food poisoning	66	2.2
Malnutrition	66	2.2
Exposure	56	1.8
Enteritis	43	1.4
Aspergillosis	42	1.4
Sarcosporidiosis	21	0.7
Selenium poisoning	17	0.5
Toxemia	10	0.3
Tuberculosis	9	0.3
Peritonitis	7	0.2
Nutritional roup	6	0.2
Coccidiosis	3	0.1
Strychnine poisoning	2	.06
Impaction	2	.06
Gout	2	.06
Suffocation	1	.03
Neoplasm	1	.03
Endamœba	1	.03

artificially produced by inoculation of the toxin in the laboratory. It has been found by experimentation that if an average dose of toxin is given, that is, a dose that kills a bird in 36 to 50 hours, petechiation of the heart is generally produced, whereas if an extremely large dose is given, killing a bird within a few hours, these lesions usually are not present. Also, if a very small dose is given, which kills only after 72 hours or more, this petechiation is not likely to be found.

Encephalitic symptoms are sometimes observed in ducks suffering from botulism. In our early work we considered the possibility that these ducks might actually be infected with equine encephalomyelitis, which is quite common in the region where the studies were made. Transmission of the disease by intracranial inoculations into ducks and guinea pigs failed, however, to infect. Our findings of ruptured blood vessels in the brain, plainly seen in sections even under low magnification, apparently account for the encephalitic symptoms. Congestion has been noticeable in all sections made from brains of ducks that died from botulism.

Other lesions, such as bloating of the cloaca, are sometimes observed, but not frequently enough to be considered pathognomonic. Excessive mucoid secretions are often, but by no means always, found in the eyes, nares and larynx, and a mucus plug is sometimes found completely obstructing the epiglottis.

Seasonal Distribution.—Our records show the occurrence of botulism in every month of the year, although cases are rare during December, January, February and March. The peak of the sickness occurs during July, August and September.

Species Affected.—All species of birds, with the exception of vultures, appear to be susceptible to botulism intoxication in nature. Besides the birds listed below, we have records of many other species, based on evident symptoms; but inasmuch as this paper deals with actual autopsies, report is made only of those studied *post mortem.*

[See list at top of next page.]

Sarcosporidia in muscles of mallard duck.

Species	*No. Cases*
Pintail	586
Green-winged teal	392
Shoveler	95
Widgeon	76
Mallard	62
Black-necked stilt	31
Pigeon	29
Gadwall	29
California gull	28
Franklin gull	9
Cinnamon teal	18
Redhead	16
Avocet	17
Coot	11
Canada goose	7
White-faced glossy ibis	7
Brewster's egret	6
Blue-winged teal	6
Scaup	5
Ruddy duck	5
Pied-billed grebe	3
Domestic duck	3
Whistling swan	2
Goldeneye	2
Wilson snipe	2
Magpie	2
Turkey	2
Canvasback	1
Killdeer	1
Phalarope	1
Godwit	1
Duck Hawk	1
Chicken	1
Willet	1
Great-horned owl	1
Dowitcher	1
Sora rail	1
Virginia rail	1

Species	*No. Cases*
Mallards	108
Swans	65
Redheads	23
Pintails	17
Canada geese	12
Godwits	4
California gulls	3
Goldeneye	2
Gadwall	2
Coot	1
Shoveler	1
Domestic duck	1
Snow goose	1
Scaup	1
Widgeon	1

The above summary should not necessarily be taken as a true index to the incidence of botulism in the various species, as more ducks than shore birds were selected for autopsies. Lesions are more clearly defined in large birds than in the small ones; however, all ducks have been taken at random and the figures given are representative of the situation. It should be noted that pintails and green-winged teals are by far the most common species present during outbreaks at Bear River, where most of this work was done.

LEAD POISONING

Lead poisoning takes the third largest toll of our waterfowl in the region under consideration. Following is a list of records taken from our files:

The mallard is the most commonly affected, in spite of the fact that it is by no means the most abundant species present, indicating that it is definitely a matter of some form of selectivity.

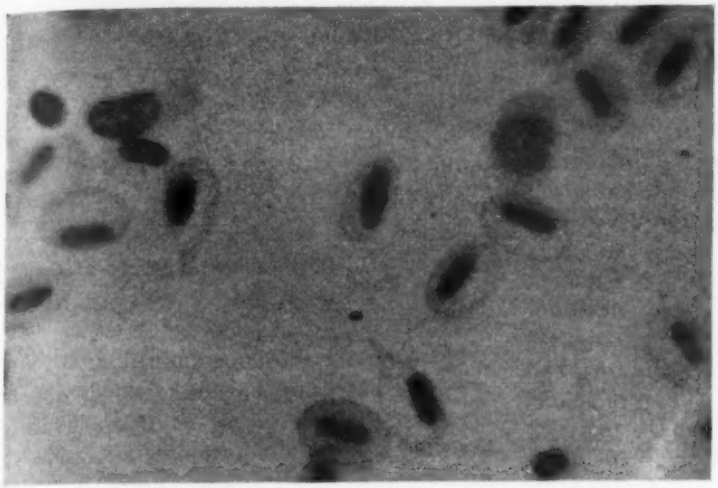
We have found by experimental feeding to ducks that only very small doses of lead are necessary to produce lethal intoxication. In one case 18 pellets weighing 2 Gm. were fed to a duck. After the duck died from lead poisoning, all 18 shot were recovered from the gizzard. These weighed 1.97 Gm., indicating a loss of weight of only .03 Gm. In other instances death was caused in mallard ducks with a single No. 5 chilled lead shot in 30 to 35 days.

Lesions.—Although this paper was meant to cover only postmortem findings, we would like to take this opportunity to describe a pathognomonic change of the blood picture which, to our knowledge, has never before been described. A photomicrograph, showing the characteristic bottle-neck red cells which are always found in varying numbers in lead poisoning, is reproduced herewith.

Poikilocytosis and anisocytosis are practically always observed, as is also a lowered hemoglobin content.

Frequently the lead shot is eroded down to unrecognizable fragments. Sloughing of the gizzard membranes is common. Atrophy of the gizzard muscles is constant in chronic cases, and is more or less marked in acute cases.

Even after paralysis sets in, there is apparently no loss of appetite, resulting in a very noticeable distention of the proven-



Characteristic bottle-neck shaped erythrocytes in lead poisoning of waterfowls.

triculus and esophagus caused by accumulated food which is unable to pass beyond the gizzard. A bright green color is nearly always noted in the gizzard and is frequently seen on the feathers surrounding the vent.

Emaciation is a characteristic feature of lead poisoning. If lead is not present in the gizzard, it is sometimes necessary to make a chemical test of the liver to obtain a positive diagnosis of lead poisoning.

MECHANICAL INJURY

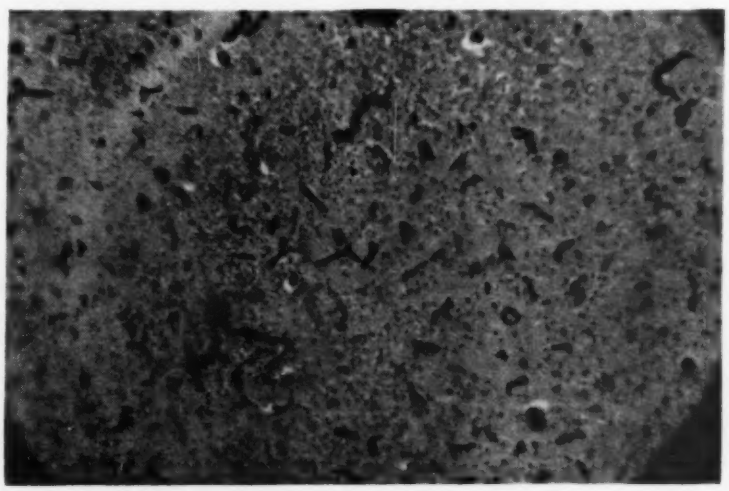
It is impossible in this paper to give a complete discussion of each group indicated on our autopsy list, but we will treat the following briefly according to the general interest.

Under "Mechanical Injury" we have included gunshot wounds, as a number of birds dying from delayed action of hunting injuries were selected for comparison with other pathologic cases.

The most interesting cases of mechanical injury are those which are caused by collision with telephone wires. This occurs most frequently during spring and fall migrations — particularly during wind storms. It may be noted this is a rather common cause of loss in birds all over the country.

PARASITISM

Parasitism appears to play a minor rôle in mortality of wild birds, although 3.3 per cent have shown some degree of infes-



Section of brain, showing congestion of capillaries following botulism (x 100).

tation. If time had permitted a detailed study of each bird, this percentage would undoubtedly be considerably higher. Cestodes have in a few cases appeared to be the primary cause of death in young Canada geese and occasionally in mallards. Contracaecum sp. have sometimes caused death of pelicans, although this parasite is almost universally present in the stomach. Tetrameres sp. are frequently present in many species of ducks, but have never appeared to cause any noteworthy damage. Leeches, particularly the Theromyzon sp., aggravate cases of botulism, but it is doubtful that they are often, if ever the primary cause of death. This matter is included, however, in our program for further investigation. Occasionally small leeches have been found in the bronchi of ducks, where they apparently have given rise to verminous pneumonia.

In one instance *Sarconema eurycerca* (Wehr) (described in J.A.V.M.A., xcvi, 1940, Quortrup and Holt) was considered as the primary cause of death of a whistling swan collected in Idaho.

In the preceding column is a list of parasites observed in various species of birds.*

Species	*Parasites Identified*
Redhead	Fimbriarioides sp.
	Diploposthe laevis
	Echinuria uncinata
Mallard	Theromyzon sp.
	Placobdella rugosa
	Dina parva
	Fimbriaria sp.
	Hymenolepis collaris
	Streptocara crassicauda
	Zygocotyle lunatum
American Merganser	Contracaecum sp.
Pintail	Polymorphus sp.
American goldeneye	*Echinoparyphium flexum*
	Paramonostomum sp.
Pied-billed grebe	Hymenolepis sp.
Gadwall	*Typhlocoelum americanum*
Coot	*Cyclocoelum pseudomicrostomum*
Blue heron	Porrocaecum sp.
Black-necked stilt	Davainea sp.
California gull	Hymenolepis sp.
	Cosmocephalus sp.
Western grebe	Ligula sp. (probably intestinalis)
Avocet	Diplophallus sp. (probably polymorphus)
White pelican	Contracaecum sp.
Whistling swan	*Sarconema eurycerca*
	Dipetalonematinae
Cormorant	Contracaecum sp.
Canada goose	Hymenolepis sp.
	Fimbriaria sp.
	Hymenolepis sp. (probably lanceolata)
Scaup	Hymenolepis sp.
Traganzas heron	Porrocaecum sp.

SARCOSPORIDIOSIS

Most of the birds examined and found infected with sarcosporidia had died from some other cause. We have ample proof, however, that this parasite can and frequently does kill its host. Recently an examination was made of a green-winged teal that had recovered from botulism a few months previously and had been kept in captivity in the meantime. This bird died in a very emaciated condition and on autopsy displayed hundreds of sarcocysts in the pectoral muscle.

Due to the fact that few data are available on the distribution of this parasite we are listing, according to states, the cases we have had opportunity to examine.

State	*Refuge*	*Species*	*Cases*
Utah	Bear River:	Pintail	4
		Shoveler	5
		Green-winged teal	4
		Coot	1
California	Tule Lake:	Shoveler	1
		Green-winged teal	1
Montana	Bowdoin	Shoveler	1
North Dakota	Des Lacs	Shoveler	2
North Dakota	Long Lake	Shoveler	1
Nebraska	Crescent Lake	Pintail	1

This gives us a total of 10 shovelers, 5 pintails, 5 green-winged teals and 1 coot.

PNEUMONIA

Of the total number of birds examined, 3.7 per cent showed some degree of pneu-

*Appreciation is expressed to Dr. Percy Moore of the University of Pennsylvania for identification of leeches, and to Dr. E. W. Price, assistant chief, Zoölogical Division, Bureau of Animal Industry, U. S. Department of Agriculture, and his coworkers for identification of most of the endoparasites listed.

monia, sometimes as primary and sometimes as secondary causes of death.

Usually pneumonia is acquired from inspiration of liquid as a complication of botulism, resulting from paralysis of the neck muscles, making it impossible for the bird to hold its head above the water. It may also be caused by faulty treatment in overdosing with medicine or flushing out the stomach excessively with water by attendants in their efforts to aid recovery.

ASPERGILLOSIS

Aspergillosis in varying degrees of intensity is frequently found in various species of waterfowl. It is surprising to note the extensive involvement of the organs with this disease in many avian cases. Usually the lungs and air sacs are involved.

Aspergillosis has been recorded in the following species:

Species	*No. Cases*
Pintail	17
Shoveler	10
Green-winged teal	10
Mallard	2
Cinnamon teal	2
Widgeon	1
Whistling swan	1

TUBERCULOSIS

The following cases of tuberculosis have been recorded:

Species	*No. Cases*
Green-winged teal	2
Redhead	2
Pintail	2
Mallard	1
Shoveler	1
Whistling swan	1

All cases observed have been advanced stages with conspicuous lesions. The liver is always the primary organ involved. Tuberculosis in waterfowls is relatively unimportant as a decimating factor, and the cases are listed here only as a matter of record.

AMEBIC DYSENTERY

All cases of amebic dysentery observed can not be described without entailing monotonous detail. There is, however, one specific case which bears discussion. In March 1941, a whistling swan was found on the Bear River Refuge displaying an extremely severe hemorrhagic enteritis. No macroscopic parasites could be seen and tests for poisons were negative. Upon microscopic examination a multitude of amebae were observed, most of which were in the cystic stage—only a very few were of the ameboid form. The severe lesions produced, led us to suspect the presence of *Endamoeba histolytica*. A marked resemblance to this parasite was evident. However, the site of the infection differed from that usually selected by *E. histolytica*, as the most conspicuous lesions were present in the upper part of the intestine. Two pigeons and three guinea pigs were inoculated by rectum and by mouth. These animals were killed and examined after six weeks, but no lesions could be found. Unfortunately, field duties at the time this swan was found prevented antemortem examinations. The tissues saved by attendants were unfit for postmortem examination.

It should be noted that the swan in question had just returned from the wintering grounds and there is a good possibility that the amebae may have been acquired somewhere in the South.

COMMENT

Statements based upon recorded figures and findings call for greater elaboration than is possible in a paper of this character. This discussion does, however, serve to illustrate the many pathologic conditions that take a toll from our valuable wildlife resources. It is pointed out that wild species are probably subject to as great variety of disease conditions as are domestic poultry. Likewise it is noted that the wild groups are less tolerant of autopollution and unhealthful environments than are farm flocks.

More than 50,000 ducks and geese winter at the St. Mark Refuge of western Florida.

There are few if any wild animals that are not some good, somehow, somewhere—yet, says *Our Dumb Animals*, if any of them does a little harm someone wants to annihilate all.

The Susceptibility of Dogs to Virus of Equine Encephalomyelitis (Western)*

CARL F. SCHLOTTHAUER, V.M.D.
Rochester, Minn.

IT HAS BEEN shown experimentally that many species of mammals and birds are susceptible to equine encephalomyelitis. This disease has occurred spontaneously in various species of lower animals and in man, but its spontaneous occurrence in dogs has not been reported.

A marked increase in the incidence of encephalitis in dogs was noted in this area during the summer and early fall of 1937 and 1938. Dogs of all ages were affected. The symptoms manifested indicated disseminated disease of the brain. Most of the affected animals succumbed or were destroyed when it was apparent that their condition was hopeless. Necropsy was performed on many of them. Gross examination revealed the cerebrospinal fluid to be slightly turbid and increased in quantity. Microscopic examination revealed disseminated lesions in the brain. They were characterized by infiltration of lymphocytes in the perivascular lymph spaces (fig. 1). Specific cell inclusion bodies could not be demonstrated. The lesions were characteristic of those caused by neurotropic viruses.

Because of the seasonal occurrence of this disease in dogs and the fact that equine encephalomyelitis was prevalent in this area at that time, the spontaneous occurrence of equine encephalomyelitis in dogs was considered, but attempts to isolate a virus from the brain of these dogs through animal-inoculation experiments were unsuccessful. This, however, may have been due to the chronic state of the disease when the tissues were obtained for study. Experiments to investigate the susceptibility of dogs to equine encephalomyelitis (western) were begun at that time. Three adult dogs were inoculated intracerebrally with a suspension of guinea pig brain that was known to contain equine encephalomyelitis virus (western) and several adult dogs received subcutaneous inoculations. As none of these animals developed symptoms, it was assumed that dogs are not susceptible to this disease.

Nothing further was done until April 1941, when a second attempt was made to transmit equine encephalomyelitis (western) experimentally to dogs. At this time nine dogs, 4 months old or less, were used. These dogs were immune to canine distemper and had not been exposed to equine encephalomyelitis through mosquitoes or flies. They were placed in three groups of three each and all animals in each group received similar treatment. For convenience each group will be discussed separately.

Group 1 consisted of three mongrel collies approximately 4 months old. They were anesthetized with ether and each was inoculated intracerebrally with 0.5 cc. of a dense (approximately 30 per cent) suspension of infected guinea pig brain in physiologic saline solution.

There were no immediate ill effects from this inoculation, but dog 1 manifested symptoms of severe disseminated encephalitis on the fourth day and succumbed on the fifth day. Dog 2 manifested symptoms of disseminated encephalitis on the fifth day and was moribund on the seventh day. It was destroyed at this time by inhalation of ether and the brain was removed for study. Dog 3 remained well.

An increase in the quantity of the cerebrospinal fluid with slight turbidity was the only gross lesion noted in both the dogs in which encephalitis developed. Microscopic examination revealed disseminated lesions in the brain of each animal. The lesions were characterized by infiltration of lymphocytes and marked degenera-

*From the Division of Experimental Medicine, Mayo Foundation.

Fig. 1. Acute disseminated encephalitis in a dog. The disease occurred spontaneously. Note that the lesions are typical of those caused by various neurotropic viruses. They are characterized by perivascular and intercellular infiltration with lymphocytes and destruction of large nerve cells (x 90).

tion of the nerve cells (fig. 2). Cellular infiltration was most marked in the perivascular lymph spaces. The lesions were characteristic of those caused by neurotropic viruses.

Two guinea pigs were inoculated intracerebrally with a suspension of brain from dogs 1 and 2. In both encephalitis developed and they died on the fifth day after inoculation.

Group 2 consisted of three mongrel terriers 3 to 4 months old. Each of these dogs was inoculated in the pad of the right hind foot with 1 cc. of the same guinea pig suspension used in group 1.

There were no immediate ill effects from the inoculation, but on the seventh day dog 4 manifested symptoms of disseminated encephalitis similar to those noted in dogs 1 and 2: marked depression, convulsions of various groups of muscles, epileptiform seizures, ataxia and other uncontrolled

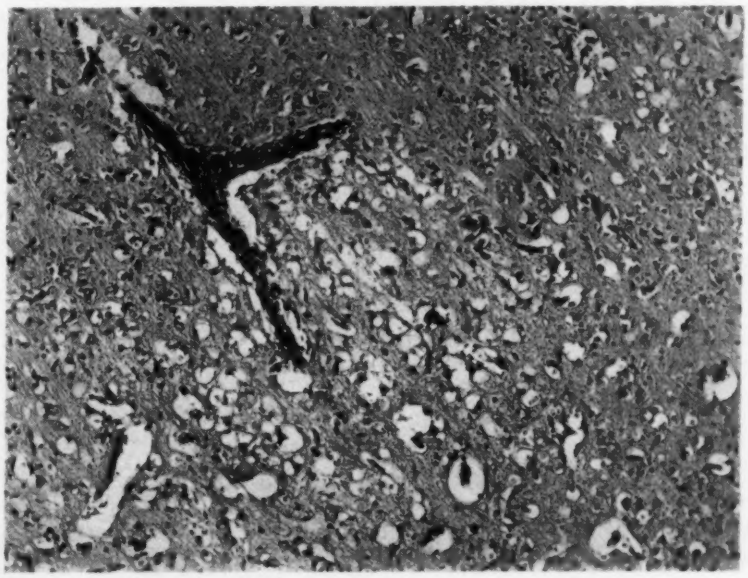


Fig. 2. Disseminated encephalitis produced experimentally in a dog by the inoculation of equine encephalomyelitis virus (western strain). Note the marked destruction of the large nerve cells and the perivascular infiltration with lymphocytes (x 90).

movements. On the eighth day the dog was semicomatose and it was destroyed by inhalation of ether. Dogs 5 and 6 remained well.

At the time of necropsy an increase in quantity of the cerebrospinal fluid with slight turbidity was the only gross lesion noted. Microscopic examination revealed disseminated lesions in the brain similar to those noted in the brain of dogs 1 and 2 in group 1.

Two guinea pigs were inoculated intracerebrally with a dense suspension of brain from dog 4, group 2. Both guinea pigs remained well and because of that the procedure employed in group 2 was repeated.

Group 3 consisted of three mongrel collies 3 to 4 months old. Each dog was inoculated in the pad of the right hind foot with 1 cc. of a suspension of infected guinea pig brain. All of these animals remained well.

SUMMARY

It has been demonstrated experimentally that some dogs are susceptible to the virus of equine encephalomyelitis (western). In two of three young dogs inoculated intracerebrally with 0.5 cc. of a dense suspension of infected guinea pig brain, disseminated encephalitis developed and the dogs succumbed. In one of six young dogs inoculated in the pad of the right hind foot with 1 cc. of a similar suspension of brain, disseminated encephalitis developed and the dog succumbed. The lesions noted microscopically in the brain were characteristic of those caused by neurotropic viruses.

In 1938, 1939 and 1940, there were 116 human cases of equine encephalomyelitis in California, all in the irrigated section of Kern county. In 1940, the disease broke off abruptly.—*American Journal of Public Health, Sept. 1941.*

The *American Kennel Gazette* for September 1941 carries an article entitled "For Army Use Only" which describes the use of courier dogs in World War I.

Eastern Equine Encephalomyelitis in the 1850s

Unaware, of course, G. H. Dadd, pioneer veterinary authority who flourished in Boston as a writer, teacher, practitioner, consultant and all-around promoter of veterinary science, published a book in 1854 that describes what would now be recognized as equine encephalomyelitis (eastern variety) under three heads, namely: "sleepy staggers," "mad staggers" and "brain fever." The latter he also called "phrenitis." A glance through the symptoms and the incidence of these puzzling attacks, sometimes "affecting two or more horses in the same stable," is offered as evidence that equine encephalomyelitis virus—eastern strain—is not the vintage of recent times.

Nitrogenous Constituents of Normal Dogs' Blood

The results from the analysis of sera from 20 normal dogs were: total protein, 5.64 to 7.10 Gm., averaging 6.2 Gm. per 100 cc. of sera; albumin, 3.28 to 4.52, averaging 4.00 Gm.; globulin, 1.45 to 2.97, averaging 2.20 Gm.; N.P.N., 0.024 to 0.058, averaging 0.035 Gm.; albumin/globulin, 1.35 to 2.98, averaging 1.85.

The results from the analysis of bloods from 20 normal dogs were: urea nitrogen, 10.0 to 22.6, averaging 15.5 mg. per 100 cc. of blood; creatinine, 1.0 to 1.7, averaging 1.36 mg.; uric acid, 0 to 0.36, averaging 0.21 mg.

Although these average values are in agreement with those calculated from a large amount of data taken from the literature, the maximum and minimum values are believed to be a better representation of the limits in concentrations of those substances. [*Allison, J. B., Dreskin, H. O., Rutgers University, and Morris, M. L., New Brunswick, N. J. Data and Bibliography on Some Nitrogenous Constituents of Normal Dogs' Blood. American Journal of Veterinary Research, ii (April 1941), pp. 196-198.*]

The Value and Relative Effectiveness of Preparations of Rotenone, Derris Powder and Cube Powder as Larvicides for Cattle Grubs*

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IT HAS LONG been known that the roots of *Derris elliptica*, a shrub indigenous to the tropics of the Old World, contain materials lethal to some of the lower forms of animal life. In comparatively recent years it has been found that the roots of *Lonchocarpus nicou*, native to tropical South America, contain similar materials.[1] The product of its roots is known commercially as cube powder. One of the active ingredients of both powders is rotenone.

The purposes of the experiments reported in this paper were to determine the relative value of rotenone, derris powder and cube powder used in the form of liquids or washes as larvicides for cattle grubs, the minimum effective strength of the washes and the effects on cattle when the liquids were applied during cold weather.

REVIEW OF LITERATURE

Case[2] showed that derris powder applied dry to grubs *in situ* killed about 53 per cent of them. The work of Bishopp *et al.*[3, 4] showed that derris powder in various preparations was highly lethal to cattle grubs and that the seasonal appearance of grubs in the backs of cattle was influenced by local climatic conditions. Gaut and Walton[5] and Gaut,[6] after experimenting with various larvicides, recommended the use of a derris-soap wash on infested cattle in Great Britain. Hearle[7] recommended a similar wash as being effective, but stated that derris powder was not easily procurable in Canada. Reisinger[8] reported in 1934 on cattle-grub work in Austria. He called attention to the poor quality of some of the derris powders, the high prices and the lack of uniformity in results. Since that time derris and cube powders have been standardized as to rotenone content and current prices are much lower. In 1936, Thomas[9] signed an order of the Ministry of Agriculture and Fisheries, making compulsory the treatment of cattle infested with cattle grubs in England, Scotland and Wales. Grubs may be removed and destroyed or the cattle treated every 27 to 32 days during the grub season with a derris wash containing powdered derris root. Each gallon of the wash must contain 1.5 oz. of derris resins or 0.5 oz. of rotenone.

MATERIALS AND METHODS

The experiments were conducted in the vicinity of Colorado Springs, Colo., during the grub seasons of 1938 and 1939 and in north central Missouri in 1940. New lots of cattle were selected each year.

The altitude of the farms on which the cattle used in the experiments were located, varied from 500 ft. to about 7,000 ft. The altitude was of importance only in so far as it influenced local climatic conditions and, consequently, the time of the seasonal appearance of the grub openings in the skin of the cattle. In El Paso county, Colo., the first grub openings appeared in one herd, located at an altitude of about 5,000 ft. on December 4, 1938.

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*From the Zoölogical Division, Bureau of Animal Industry, U. S. Department of Agriculture.

[1]Clark, E. P.: Some constituents of derris and cube roots other than rotenone. Sci., lxxvi (Apr. 11, 1930), p. 396.

[2]Case, L. I.: Studies on the ox warble flies, *Hypoderma lineatum* and *Hypoderma bovis*, with special reference to economic importance and control. Virginia Agr. Exp. Sta. Tech. Bul. 39 (1929).

[3]Bishopp, F. C., Laake, E. W., Brundrett, H. M., and Wells, R. W.: The cattle grubs or ox warbles, their biologies and suggestions for control. USDA Bul. 1369 (1926).

[4]Bishopp, F. C., Laake, E. W., Wells, R. W., and Peters, H. S.: Experiments with insecticides against cattle grubs, Hypoderma spp. J. Econ. Ent., xxiii (Oct. 1930), pp. 852-863.

[5]Gaut, R. C., and Walton, C. L.: Ox warble fly. Reports on the demonstration and experiments carried out in Worcestershire in 1928 and 1929. Worcestershire County Council, Agricultural Education Sub-Committee (Oct. 1929), 26 pp.

[6]Gaut, R. C.: Area demonstration scheme (Worcestershire). Dept. Agr. Educ., Shirehall, Worcester, England.

[7]Hearle, E.: Warble flies and their control in Canada. Canada Dept. Agr. Pamph. 147, n.s. (1932).

[8]Reisinger, L.: Beitrag zur Bekämpfung der Dasselfliegen des Rindes in Oesterreich. Wien. Tierärztl. Monatschr., xx (1933), pp. 641-650.

[9]Thomas, J. H.: British warble fly order. Min. Agr. & Fish., London, England (Jan. 1936).

In another herd, 50 miles distant, but located on a high mountain plateau at an altitude of about 7,000 ft., the first grub openings were seen on January 15, 1939.

Results of careful observations of cattle in Colorado for several years indicated that the cattle grub, after forming a hole in the skin of the host animal, usually remained in the subdermal tissues about 30 days before emerging and entering the pupal stage in the ground. The experimental treatments were applied, therefore, to each lot of cattle approximately 30 days after the first grub openings appeared in the herd or lot of animals. As each lot of cattle was treated only once, the purpose was to delay treatment as long as possible without allowing any live grubs to emerge, thereby extending the period of the effectiveness of the larvicidal wash over a greater portion of the grub season.

The cattle used in the experiments included range, feeder and dairy stock selected from herds infested with grubs of *Hypoderma lineatum*. Grubs of *H. bovis* were not found in any of the experimental cattle. At the time cattle were selected for treatment, one lot from each herd was marked for identification and held untreated as controls. During the application of the washes the cattle were restrained in stanchions or chutes in the usual manner.

The derris and cube powders and the rotenone used in the experiments were ordinary, standardized, commercial products. The different washes used were prepared in a similar manner and they varied only in the kind and quantity of medicament added. Ordinary laundry soap flakes were dissolved in warm water in the proportion of 4 oz. of soap to 1 gal. of water. The medicament then was added and the mixture well stirred. The temperature of the water used in making the soap solution was approximately 100 F. The kind and quantity and the commercially classed rotenone content of the drug used in each lot of wash are shown in table I. The quantity of drug added to the soap solution as shown in the table is the number of ounces to each gallon of water. In each case the washes were applied shortly after they were prepared.

A single application of wash was made to each lot of cattle. The liquid, while warm, was applied to the backs of the animals from pint jars equipped with perforated lids. Operators, stationed at each side of the animal being treated, spread the wash into the hair coat and over the skin with ordinary, stiff-fiber scrub brushes. The washes were applied to the area of skin commonly infested with cattle grubs. This area extends on each side of the animal from the scapula to the external angle of the ilium and for a distance of about 14 in. lateral from the median line of the back. Approximately 1 pt. of wash was used on each animal, somewhat more for large, long-haired cattle, and less for small or short-haired animals.

Each lot of cattle was inspected three to five days after the wash was applied. Subsequent examinations of the treated and control cattle in Colorado were made every two or three weeks until all grubs had emerged from the control cattle. All grubs appearing in the treated cattle in Colorado during the entire grub season were extracted, counted and classed as dead or alive. The Missouri cattle were treated on January 29 and 30, 1940. The first post-treatment inspections were made on February 5 and 6, 1941, and subsequent inspections were made every two weeks until March 14, 1941. All grubs were extracted from the treated cattle in Missouri except lots 9 to 16, inclusive, as shown in the table. Classification of grubs in these lots was determined by palpation, and in doubtful cases by extraction.

Two lots of cattle were treated with rotenone wash. Various lots of cattle, as shown in the table, were treated with derris and cube washes. The derris powder and cube powder used in the washes consisted of two classes, namely, those said by the manufacturer to contain 4 per cent of rotenone and those said to contain 5 per cent of rotenone. Derris washes and cube washes in each class were compounded to contain 16, 12 and 8 oz., respectively, of derris powder or cube powder to each gallon of water used in preparing the washes. Different lots of cattle were treated with each kind of wash.

RESULTS

Rotenone, in chemically pure and 90 per cent pure form, was not as effective in killing cattle grubs as derris powder or cube powder. Rotenone was not used, therefore, in the experiments in 1940.

The powders classed as containing 4 per cent of rotenone were as effective and in some cases more so than those said to contain 5 per cent of this compound. Likewise the washes containing 12 oz. of either of the powders to a gallon of water were as effective as those containing 16 oz. to a gallon. These findings indicate that the minimum requirement for dependable washes is 12 oz. of either powder to a gallon of water, and that the powders classed by the manufacturer as containing 4 and 5 per cent, respectively, of rotenone were about equally effective.

As shown in the table, when 12 or 16 oz. of the powders were used to each gallon of water, 90 to 100 per cent of the grubs in

the treated cattle were killed. Presumably, this variation was due to the appearance of new grubs after the medicaments ceased to be effective, or for some reason the larvicide did not come in contact with all the grubs present at the time of treatment.

The atmospheric temperatures at the time the washes were applied to the cattle are shown in the table. Although the liquids froze on the backs of the animals when applied in sub-freezing temperatures, the cattle evidenced no discomfort. All the treated animals were watched closely for symptoms of chill, but no signs of injury were observed at any time during the experiment, although the animals were exposed to cold weather after treatment was applied.

In restraining and treating large herds of cattle with washes, a crew of four men was used. Such a crew treated 60 cattle an hour, or an average of 15 an hour for each man.

DISCUSSION

Four treatments of cattle with washes, as suggested by Gaut and Hearle for use in England and Canada, probably constitute the required number of applications of the wash where *H. bovis* or when both species of the warble flies are present. In Colorado and Missouri, where the experiments were conducted, only one species, *H. lineatum*, was found. *H. bovis* was not found in any of the animals examined. A single treatment during the grub season, properly applied to all infested cattle in a relatively large area, may afford a fair measure of

TABLE I—Data Relative to Treatment for the Destruction of Grubs with Rotenone, Derris Powder and Cube Powder Washes*

Cattle			Condition of Hair	Outside Temp.†	Drug Employed	Amt. Drug Per Gal. (Oz.)	Rotenone in Drug (%)	Number of Grubs			Grub Mortality (%)
Group No. and Breed‡	Number	Age‖ (Yrs.)						Dead	Live	Total	
Colorado											
1 He	50	V	long	50	rotenone	1	90	531	107	638	83.2
2 He	50	1	long	36	derris	16	5	1,114	38	1,152	96.7
3 He§	21	V	long	——	——	——	——	——	179	179	00.00
Colorado											
1 He and A	9	1	long	32	derris	16	5	118	2	120	98.2
2 Ho	10	1	short	32	derris	16	5	138	5	143	96.5
3 Ho	10	1	short	30	derris	12	5	423	2	425	99.5
4 Ho	10	1	short	30	derris	8	5	308	54	362	87.8
5 Ho	21	1	short	35	derris	16	4	243	27	270	90.0
6 He and A	10	1	long	32	derris	16	4	126	7	133	94.7
7 Ho	9	1	short	30	derris	12	4	310	10	320	96.9
8 Ho	10	1	short	30	derris	8	4	113	44	157	71.9
9 Ho	21	1	short	30	cube	16	4	456	24	480	95.0
10 Ho	10	1	short	30	cube	12	4	352	17	369	95.4
11 Ho	10	1	short	30	cube	8	4	331	21	352	94.0
12 Ho	17	1	short	30	rotenone	1	100	191	132	323	59.1
13 Ho§	35	1	short	——	——	——	——	49	850	899	5.5
Missouri											
1 He	10	A	long	10	derris	16	5	38	1	39	97.5
2 S	10	A	long	6	derris	16	5	93	1	94	98.9
3 He	10	1	long	10	derris	12	5	71	1	72	98.6
4 S	10	2	long	6	derris	12	5	66	1	67	98.5
5 He	10	1	long	10	derris	16	4	38	1	39	97.4
6 S	10	1	long	6	derris	16	4	88	0	88	100.0
7 He	10	1	long	10	derris	12	4	68	3	71	95.8
8 S	10	V	long	6	derris	12	4	74	0	74	100.0
9 He	10	A	long	10	cube	16	5	43	0	43	100.0
10 S	10	V	long	6	cube	16	5	131	1	132	99.2
11 He	11	A	long	10	cube	12	5	43	4	47	93.6
12 S	10	1	long	6	cube	12	5	123	0	123	100.0
13 He	10	1	long	10	cube	16	4	28	0	28	100.0
14 S	10	A	long	6	cube	16	4	59	0	59	100.0
15 He	9	1	long	10	cube	12	4	51	0	51	100.0
16 S	8	A	long	6	cube	12	4	36	0	36	100.0
17 He§	10	A	long	——	——	——	——	1	64	65	1.5
18 S§	10	1	long	——	——	——	——	0	90	90	0.0

*Experiments were conducted in Colorado in 1938 and 1939 and in Missouri in 1940.
†Indicates the atmospheric temperature (F.) at the time of applying washes.
‡A = Angus, He = Hereford, Ho = Holstein, S = Shorthorn.
§Controls.
‖V = Various ages; A = Aged.

control, but one treatment a season can not be depended upon to eradicate cattle grubs.

As previously stated, a single application of wash to each animal in each lot of cattle was made about 30 days following the appearance of the first grub openings. This was done to determine whether or not the wash would remain effective throughout the remainder of the grub season and kill all larvae before they emerged. Since the larvae continue to emerge during a period of about 90 days, the one application should be made as late after the first holes appear in the skin as is safe in order to extend the period of effectiveness of the wash over a greater portion of the grub season. It has been found unsafe to delay treatment longer than 30 days, since natural emergence of the grubs may occur shortly after this period. Just how long the washes remain potent on treated animals is not known. Probably this varies considerably, depending upon rainfall and other factors.

Derris and cube washes are effective larvicides for cattle grubs and the mixtures are easily prepared and applied. They are not unpleasant on the hands of workers and are easily washed from buckets and utensils used in preparation and application. These larvicides are not toxic to livestock, even when taken into the mouth by licking, a common occurrence among cattle during the grub season.

In some cases grubs have been found on cattle in locations other than the back and upper parts of the sides. By limiting the treatment to the areas of skin over these parts, such grubs would not be reached. As such cases are not common, they were not taken into consideration in these experiments.

SUMMARY

Chemically pure rotenone and a preparation containing 90 per cent of rotenone, used in the form of washes and applied to infested cattle once during the grub season, were not as effective in killing cattle grubs *in situ* as derris or cube washes.

Standardized, commercial derris powder and cube powder, used in the form of washes, were equally effective in killing cattle grubs *in situ*.

Derris powder and cube powder, classed by the manufacturer as containing 4 per cent of rotenone, were as effective in killing cattle grubs as like powders said to contain 5 per cent of rotenone.

Washes made in the proportion of 12 oz. of derris or cube powder to 1 gal. of water were as effective as those made in the proportion of 16 oz. to 1 gal.

Washes containing 8 oz. of derris or cube powder to 1 gal. of water were not fully effective as larvicides for cattle grubs.

Washes made in the proportion of 4 oz. of soap dissolved in 1 gal. of warm water and 12 oz. of either derris or cube powder proved to be safe and effective larvicides for cattle grubs.

Single treatments of infested cattle with derris or cube washes containing 12 oz. or more of powder to 1 gal. of water and applied about 30 days after the first grub openings appeared, killed from 90 to 100 per cent of the grubs appearing in the treated cattle during the grub season.

One treatment a season with derris or cube washes can not be depended upon to eradicate grubs of *Hypoderma lineatum*, but it can be depended upon to effect a fair measure of control.

Cattle were not visibly injured in any way by washes applied during cold weather.

Protein-Carbohydrate-Fat

Broadly stated, protein, carbohydrate and fat, the three basal foodstuffs, are interchangeable. In baseball talk, any one of the three will pinch hit for the other, whenever necessary. The chemistry of these interchanges is the fundamental physiology of metabolism (nutrition), which should be known and well understood before worrying over the action of vitamins, hormones and minerals. There is plenty to be known about the mutations, permutations and combinations of protein alone (with its 22 amino acids) to account for growth, health, development and the continuation of life before bothering about the "trace matériels" that have the world dizzy.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Retained Placenta*

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RETAINED PLACENTA means that the fetal placental tufts fail to separate from the maternal placental crypts and to fall away with the fetal membranes at the optimum time. Retention of the fetal membranes and placenta may accompany abortion, premature birth, so-called stillbirth (expulsion of a dead, full-term fetus), dystocia, dropsy of the amnion, or birth that appears to be normal. If the parturition is normal, the placenta should drop away not later than six hours following the expulsion of a calf and not later than one hour following the delivery of a foal. In the cases reported in this paper the placenta was retained for much longer periods and a diagnosis of retained placenta was made regardless of the other diseases that accompanied it. Acute or chronic metritis with placentitis was present as the most constant underlying disease.

Retained placenta has long been an annoying and important problem for veterinarians in all parts of the world where dairy cattle are bred. It is less common in mares, but is a rather serious problem in some bands of draft mares. In the latest discussion of this subject by Williams[1] it is referred to as one of the most destructive types of genital disease in cattle.

ETIOLOGY

The cause of retained placenta has remained obscure. It is generally stated by American and European writers that *Brucella abortus* plays an important rôle and that infection is an important cause.

In 1925, Udall and others[2] studied 1,000 cases of genital disease. These were routine cases handled in the ambulatory clinic of the New York State Veterinary College during a period of 4½ years. In the group, 151 cases of retained placenta occurred accompanying the act of abortion. Slightly over one half of these were associated with Bang's disease. From a second group of 178 cases of retained placenta after a living calf had been expelled, it was possible to study 75 additional cases by laboratory methods. Of these, as shown in table I, 26.6 per cent showed some evidence of being associated with Bang's disease. It is obvious that not all of the cases of retained placenta in the two groups associated with Bang's disease were actually due to *Br. abortus*.

During the year ending July 1, 1941, 207 cows were treated for retained placenta in the same clinic. Bang's disease was known to be present in 42 of the affected cows, while it was positively known that 83 cows were maintained in Bang's disease-free herds under careful supervision. The balance of the group, 82 head, were in herds where there was no clinical evidence of Bang's disease. No doubt a few of the last group were due to Bang's disease. We estimate that *Br. abortus* was an important etiologic agent in less than one third of the cases in our clinic. Our highest yearly incidence has been in negative herds that

*From the New York State Veterinary College at Cornell University; presented before the Section on Surgery and Obstetrics at the seventy-eighth annual meeting of the AVMA, Indianapolis, Ind., August 11-15, 1941.

[1]Williams, W. L.: Diseases of the Genital Organs of Animals (2nd ed., 1939), pp. 516-536.

[2]Udall, D. H., Cushing, E. R., and Fincher, M. G.: Cornell Vet., xv (1925), pp. 121-136.

suddenly became positive.

We have several herds where vaccination with a living culture has been used for many years. Fortunately, there has been no more retained placenta in these herds than in most herds of the same size where Bang's disease was absent.

Liebsch[3] reported that 203 cases studied by him in central Europe showed *Br. abortus* to be the cause in 34 per cent. He listed a small group as accidental, or as due to lack of uterine tone, and 47 per cent as due to unknown causes. Udall[4] reported that two cases in cattle were apparently due to some variety of streptococci.

It became evident from a detailed study made by Williams, Udall, Frost *et al.*[5] that the uterine surface of the chorion is a replica of the endometrium. It was stated by them in 1924 that, strictly speaking, retained placenta is not a disease, but merely one of the outstanding phenomena of placentitis. Histologically they found various changes, but necrosis was the prominent feature in all the placentas examined.

Gilman[6] has discussed the various causes of abortion in cattle. It is obvious that most of these etiologic factors cause endometritis and placentitis. These abortions are often accompanied by retention of the fetal membranes and placenta. This is especially true of the abortions due to mould, which Birch and Gilman[7] have described. We have encountered very few of these in the clinic. The cotyledons in cases of mould infection show a marked necrosis with an excavation where the maternal cotyledon was attached. They have a heavy intercotyledonary chorion. Most of the peduncles of the maternal cotyledons sloughed off easily so that the entire maternal and fetal cotyledons came away with the chorion. This may also happen in a placenta with the typical leathery necrosis of the chorion observed in Bang's disease (fig. 1).

[3]Liebsch, E.: Arch. f. Tierheilk., lxxi (1936), pp. 1-40.

[4]Udall, D. H., Cushing, E. R., and Fincher, M. G.: Cornell Vet., xiii (1923), pp. 170-178.

[5]Williams, W. L., *et al.*: *Ibid.*, xiv (1924), pp. 315-374.

[6]Gilman, H. L.: *Ibid.*, xxix (1939), pp. 153-165.

[7]Birch, R. R., and Gilman, H. L.: *Ibid.*, xv (1925), p. 81.

In addition to all these infections that are conceded to be present in the sealed uterus, it is evident that a wound infection may take place during or after birth. In one instance a few foot-rot cases were treated and immediately following this a placenta was removed. *Actinomyces necrophorus* was apparently carried into the uterus by the operator. The cow died of septic metritis, apparently due to necrophorus infection. In a few other instances this infection has been found in the puerperal uterus at autopsy, apparently having entered after the parturition or during dystocia.

In the majority of cases of retained placenta the exact cause is unknown, but certain etiologic factors are suspected. In a few herds free from Bang's disease more than 50 per cent of the cows have retained their placenta in a given year. The first thing we suspect here is a nutritional disturbance, possibly including a lack of iodine. In some of these the good results following a change of bulls, even though the herd sire was fertile, have suggested that the bull might spread some infection that predisposed to retained placenta. These problem herds usually contain a high percentage of purebred dairy cattle that are fed sufficiently well to enable them to make good production records. The point is that several causes may operate in the same herd or even in the same cow. Other common causes are hereditary influence, poor hygiene at breeding and in the maternity barns, poor control of diseases of calfhood and forced feeding for records with inadequate exercise and resultant obesity.

A few examples may show what is meant by poor breeding families and the possible damage that they may do from a hereditary standpoint. All of the cases to be described are in herds where Bang's disease, or other recognizable specific infection, is absent.

A fine type, high-producing, Ayrshire cow required eleven services for seven pregnancies and delivered three bulls and five heifers, including a pair of twins. In spite of this average fertility she retained the placenta at four of the seven parturi-

tions. Her four daughters of breeding age required 18 services for eight pregnancies. Each daughter had one retained placenta and one of the twins retained twice, a total of five retained placentas in the four daughters during eight pregnancies. A granddaughter has calved normally once. It will be interesting to follow this family through a few more years.

In the same herd another Ayrshire had an unusually poor placenta and congenital absence of cotyledons on the median side of the uterine horns as shown by a study of the chorion at her first pregnancy. She became pregnant six times and retained her placenta two of the six times. Once it followed an abortion at eight months and the other time it followed twins. Four parturitions were essentially normal. She has one daughter that required five services for her first pregnancy, which terminated with dystocia and retained placenta. Another fine type Ayrshire required 22 services for five pregnancies with two retained placentas, and was then sold as hopelessly sterile. Her daughter which has calved retained the placenta with the first calf.

As a contrast, there is an Ayrshire in the same herd which has produced eleven calves from 27 services and has retained her placenta but once. She is safely pregnant now at 16 years of age. A bull from this cow is being used in the herd and may transmit fertility.

In another instance, in a Holstein herd, a case of retained placenta and septic metritis is possibly traceable to poor reproduction in her maternal ancestry. A cow,

Fig. 1. The heavy, thickened area at the left is a typical, leathery, necrotic, gravid chorion of Bang's disease. The nongravid chorion at the right is longer and better than the gravid. Similar lesions also are seen rarely in the absence of Bang's disease. This placenta was removed from a cow which had aborted at 7 months. When such a chorion is being removed, the dangers of spreading infection are great.

called A1, was from a dam with low fertility, repeated metritis at parturition and a poor, nongravid chorion. A1 calved but twice, having two daughters. She was then killed because of sterility. Her second daughter, Fay, had a bull and two daughters. Fay had a slight torsion of the uterus at the first parturition and an undue amount of metritis at the last two parturitions. She was then sold because of incurable sterility. Fay's last calf, E, expelled her placenta eleven hours *post partum* with the aid of progynon-B subcutaneously and pituitrin intravenously. Her chorion had just one small cotyledon on the right, nongravid horn and 42 on the left. Severe metritis was present for several days. E is worthless as a breeder, from her history and from her congenital lack of uterine caruncles.

The majority of the cows in these herds breed about as well as those in most large dairy herds, yet there are a few families that show unusually poor records with a tendency toward twinning, sterility and dystocia as well as retained placenta. The cows in these questionable groups are usually of excellent type with good or unusual production, and a breeder of purebreds is inclined to look for a "cure" rather than to accept the theory that they are dangerous from a hereditary standpoint.

My limited experience with retained placenta in brood mares presents some evidence that the same general principles apply regarding the etiology, except that the bacteriologic causes are quite different, as shown by the well-known literature of Dimock and Edwards of Kentucky.

Caslick[8] has shown that much of the genital infection in light horses is associated with vulvar and other anatomic defects that lead to "wind sucking." He also substantiates the statement made above that some of the infection in these cases enters after the cervix opens, during and after parturition. He has observed that when mares jump up immediately after foaling, a great rush of air often fills the pendulous vagina and uterus. If the mare remains recumbent until the placenta is about to drop away, less air is aspirated into the gaping genital tract. This contamination of the uterus with stable air and dust causes a slight degree of metritis. It is conceivable that this could accentuate an existing inflammation with resultant retained placenta at this or a later parturition.

Jennings,[9] in an excellent recent report, shows that, in the light mares with which he was working, retained placenta accompanied the larger foals and that genital diseases of mares were increased by breeding on the ninth day *post partum*. His conclusions are interesting in view of the apparent difference in the incidence of retained placenta and other genital diseases in draft mares and in Thoroughbred mares. The draft mares apparently inherit or at least appear to have much more trouble. This may be due to the flagrant neglect of breeding hygiene, or insistence on ninth day breeding, or partly to the excessively large size of the draft foals.

PREVENTION

The above suggestions regarding the etiology and pathology underlying retained placenta may explain why it is difficult to maintain a herd in which no retained placentas occur. Williams[1] takes an optimistic view when he states, "When the subject is carefully studied from various viewpoints and the fundamental causes learned, the phenomenon is preventable: it is one of the most readily and successfully preventable diseases in the field of genital pathology."

Successful control of Bang's disease has usually greatly reduced the incidence of retained placenta. In addition to this, breeding stock should be selected from fertile strains or families. Each breeding animal ideally should have a normal genital tract, or else the animal should not be used for breeding purposes. Careful physical examination, along with careful consideration of the breeding records, may show that certain cows or bulls should be discarded. Un-

[8]Caslick, E. A.: Cornell Vet., xxvii (1937), pp. 178-187.

[9]Jennings, W. E.: *Ibid.*, xxxi (1941), pp. 197-216.

fortunately, there is but one way to determine the arrangement and number of the caruncles on a cow's endometrium, and that is by a study of the chorion. Such studies are often instructive in determining which cows are poor risks as breeders. These cows with functionless areas in the uterus and, therefore, on the fetal chorion (fig. 2) are not always detected by rectal examination. They may be born with no caruncles in a part or all of one uterine horn. When cows with such defects are discovered, they should be eliminated as breeders.

In cattle and mares an adequate rest period following parturition has great value. Obviously, it can not cause those with highly abnormal genitals to function normally. Careful observance of the general rules that promote genital health in the mare or cow will reduce to some extent the incidence of retained placenta.

The rather high incidence of retained placenta in herds free from Bang's disease has suggested the necessity for some preventive treatment of each cow at the time of parturition. Shaw[10] tried posterior pituitary extract on 100 cows in a large herd in New England. He injected from 4 to 9 cc., using one to three injections, not later than 1½ hours after parturition. One per cent retained the placenta when this was tried, while 10 per cent of an untreated control group of 47 cows in the same herd retained their fetal membranes. Benesch[11] stated that posterior pituitary extract is useful and that the effect persists for a longer time if one injects 10 cc. of it epidurally. In Benesch's text[12] he states that this amount may be used either epidurally or subcutaneously, and it should be given at once after parturition.

We have used the subcutaneous injection for many years, and during the past few years we have used the epidural injection of pituitrin in several cases with apparently good results. Recently, we have given progynon-B,* a strong estrogen, in doses of 2 cc. (20,000 rat units) subcutaneously. We then followed this immediately, or in a few hours, by a subcutaneous or intravenous injection of 5 to 10 cc. of posterior pituitary extract. There is little doubt but that this expensive combination of hormones will cause more violent uterine contractions than is produced by posterior pituitary extract alone. It has not always satisfactorily reduced the degree of acute metritis or sterility that followed, although several cows so treated have expelled the placenta promptly and functioned normally. Although we lack accurate data to prove the point, we feel that some cases of retained placenta are prevented by the use of 5 to 20 cc. of pituitary extract—10 cc. or less for the first dose and, if necessary, 5 cc. every half hour for three or four doses. Each cow must be so treated immediately after parturition. A cheaper procedure in

—*After Williams et al., 1924.*

Fig. 2. This fetal sac with 90-day embryo has a smooth, nongravid chorion (4), very few cotyledons on the base of the gravid side (2) and only 30 fetal cotyledons at the apical end (1) of the gravid horn. The cervical area is located near 3. This is the result of Bang's disease and other infections. Perhaps improper methods of handling used in 1921 may have contributed.

A similar, functionless, nongravid chorion often is seen in primipara and cows that have had no known previous genital disease. The gravid chorion is then likely to be retained post partum.

*Schering Corporation, Bloomfield, N. J.

[10]Shaw, R. N.: Lederle Bul., vii (1938), p. 9.

[11]Benesch, F.: Proc. 11th Int. Vet. Cong., iii (1930), pp. 351-368.

[12]*Ibid.*: Veterinary Obstetrics (trans. by Wright), 1938, p. 253.

TABLE I—Etiology of Retained Placenta

YEARS	CASES STUDIED	POSITIVE BR. ABORTUS	PER CENT POSITIVE	NEGATIVE BR. ABORTUS	PER CENT NEGATIVE	NO CLINICAL EVIDENCE OF BANG'S DISEASE
1920-25	75	20	26.6	55	73.4	
1940-41	207	42	20.3	83	40.0	82 (39.7%)

these troublesome herds is to insert some nonirritating substance in capsule or in suspension in oil into the uterine cavity. This may be done safely at 12 to 72 hours after calving whether or not the membranes are retained, the hope being that it will reduce the degree of acute metritis in the whole herd. None of these procedures is necessary or advisable in herds where the incidence of trouble is low or where the value of the animals is small.

TREATMENT

It is shown in table II that reasonably careful treatment of 3,544 cases of retained placenta that occurred in the ambulatory clinic of the New York State Veterinary College during a 21-year period was followed by an average mortality of 2.28 per cent. The mortality in untreated cases is conceded to be low. The manual removal of placentas from valuable purebred dairy cows must be attempted cautiously so that the mortality is not increased by too vigorous or careless treatment.

Udall and Gibbons[13] reported fatalities resulting from treatment applied too soon after parturition. They stated that one of the chief dangers of the early removal of the membranes is the mechanical injury that comes to an organ in the state of acute inflammation, congestion and swelling. In table II it is shown that 755 cases treated during an eight-year period, from 1920 to 1928, showed a higher average mortality (4.23 per cent) than in the following years. Part of this trouble may have been due to the use of aqueous antiseptic uterine douches and to a more frequent attempt at removal sooner than three days *post partum*.

Wilson[14] stated that a mortality of 10 per cent occurred following early removal of the placenta in woman. It is suggested by the discussion of his paper that human obstetrists are not as enthusiastic about early removal as they were at one time. The correct time for removal is not agreed upon, but it was stated that where infection is present, as in abortion, the placenta should not be removed at once. Evidently, the correct time to remove the de-

[13]Udall, D. H., Gibbons, W. J., and Gibbons, R. V.: Cornell Vet., xxvii (1927), pp. 406-407.

[14]Wilson, K. M.: Am. J. Obst. & Gynecol., xl (1940), p. 854.

TABLE II—Mortality of Retained Placenta in Cattle

YEARS	NO. YEARS	METHOD OF HANDLING	NO. TREATED	NO. DIED	PER CENT DIED
1920-28	8	Early or late removal and plenty of douching	755	32	4.23
1928-34	6	Removal at 72 hours or later; virtually no douching	1,109	31	2.79
1934-41	7	Late removal without douching; dextrose and calcium per vein; liberal use of sulfanilamide	1,680	18	1.06
7/1/20-7/1/41	21		3,544	81	2.28

ciduate placenta of woman is still in dispute, although it is common practice to remove it very early.

Palmer,[15] after observing 44 cases of retained placenta in two Bang's disease-free herds, found that 6.79 days was the average time at which the placenta was expelled spontaneously. Thirteen per cent of the cases showed loss of appetite in the absence of treatment and 9 per cent became septic and required treatment.

Three cases of tetanus following retained placenta were described by the writer.[16] It is interesting that in two of these cases the cows were not treated and the fetal membranes were allowed to drop away several days after calving. In the third an unskilled layman had applied manual removal. Tetanus has followed none of the large group of cases treated in our clinic. There are parts of Europe and the United States where retained placenta is followed by death from the action of organisms like those causing malignant edema. In these areas treatment is imperative and the prognosis is not always good.

Case[17] stated 15 years ago that he did not remove the placenta prior to 72 hours *post partum*. He urged his clients to have the affected cows examined five to ten days later to prevent septic metritis, pyometra and sterility.

Our method of handling these cases has been based on the same general plan. We allow sufficient natural separation or necrosis to take place before we irritate the genital tract by an attempted removal. Removal is then easily and quickly accomplished. During the past 13 years we did little douching of the uterus at the time of removal and, as shown in table II, the results were good. We substituted wiping the uterus with dry swabs of cotton to remove remaining shreds and exudate after the placenta was removed. We often douche the vagina with plenty of warm chlorine or therapogen solution, and in rare cases a great deal of serum and sloughing maternal cotyledons may be siphoned out of the uterus. We do this by placing one end of a soft rubber tube filled with an aqueous or oily antiseptic solution into the uterus and then, without putting any fluid into the uterus, allow the exudate to siphon back.

It is desirable in rare cases to remove the fetal membranes rather early because of extreme tenesmus. In these cases or in any case where severe straining develops while removal is being attempted, it is difficult to be clean even if suitable apparel and abundant clean water are available, as shown in figure 3. We carry our own supply of water with us, since it saves time and helps to present an appearance of attempting to be clean. The suggestion of Richter[18] to inject a small amount—5 to 8 cc.—of 1 or 2 per cent tutocaine or procaine, epidurally, has made removal in such cases easy. It is much safer for the patient than exhausting her by too much straining.

If the placenta can not be removed in a very few minutes at 3 to 4 days after parturition, we insert some of the following material into the uterochorionic space and among the fetal sacs of each uterine horn, and allow the placenta to fall away. If necessary, the material is placed in the uterus more than once and the placenta detached a few days later.

The following oily mixtures are safe and may have value if they are not expelled by the cow at once. We suspend 1 oz. of bismuth-formic-iodide, or 0.5 oz. or less of bismuth-thymol-iodide, in a pint of mineral oil. An equally effective mixture, suggested by Krill,[19] consists of equal parts of warm mineral oil and castor oil. These protectants are inserted with a funnel or pump and tube, 250 to 1,000 cc. being used, depending upon the amount we think the cow will retain. Liquid bipp, iodoform and bismuth in oil, is a trifle better. This is seldom used because of the danger that the odor of the drug may ruin the market for the

[15]Palmer, C. C.: J.A.V.M.A., lxxx (Jan. 1932), pp. 59-68.
[16]Fincher, M. G.: Cornell Vet., xxii (1932), p. 75.
[17]Case, C. H.: *Ibid.*, xvi (1926), p. 119.
[18]Richter, J.: Deut., Tier. Wochnschr., xlv (1929), p. 1; abst. by W. L. Williams, Cornell Vet., xix (1929), p. 316.
[19]Krill, W. R.: Personal communication.

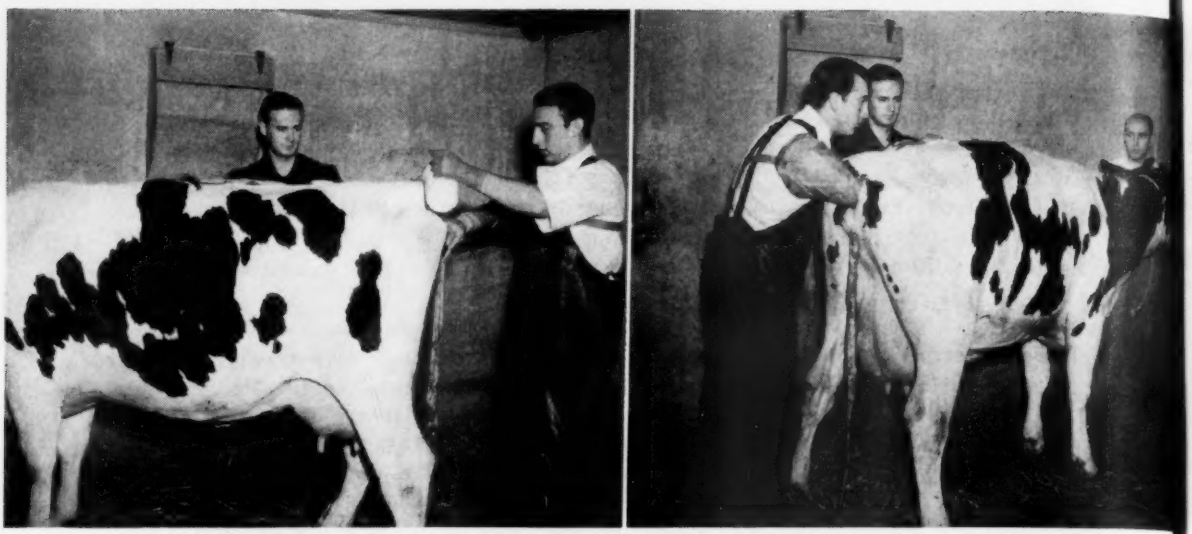

Fig. 3. Apparel and equipment used in handling retained placenta. The rubber gloves, sleeve, overalls and boots make it possible to treat these infected cows comfortably and without danger of spreading infection or becoming infected as a result of handling the diseased membranes. The 20 quarts of hot water, quart enamel cup and good hard-water soap are important parts of our equipment. (See picture below.) We usually take these with us on calls to save time and keep clean.

milk from the whole herd. We frequently use uterine capsules which contain fine, fluffy, light powders, such as bismuth-formic-iodide. Carbo animalis, to which has been added a trace of chlorine, has been popular and effective because it also scatters over a large area of the uterus. We often use capsules filled with a mixture of boric acid powder, 3 parts, and bismuth-formic-iodide, 1 part. We have used capsules of sulfanilamide in the uterus of a few cows with no ill effect. These and many other uterine capsules, filled with nonirritating substances, have done no harm. The insertion of capsules has become the most practical method to use when treating several retained-placenta and metritis cases daily.

The type of retained placenta that requires careful treatment is that where septic metritis is present. We feel that the intravenous use of dextrose and calcium gluconate is valuable in these cases even in the absence of acetonemia or milk fever. They are a necessity when the common complication of acetonemia exists.

In connection with the use of calcium it is interesting to note that Burgess[20] presented a practical paper on retained placenta which led to a discussion by Greig of Scotland. He (Greig) stated that several practitioners had reported that the intravenous use of calcium gluconate had been quickly followed by expulsion of the membranes. Greig further suggested that the blood calcium tended to be low during the immediate post-parturient state and that this might account for the flaccid condition of the uterus.

We use sulfanilamide, administered orally

[20]Burgess, J. W.: Vet. Rec., xv (1935), pp. 928-932.

in capsules or on the tongue, in the most severe septic metritis cases. The dose is 2 to 3 oz. daily of the powder for a cow weighing 1,000 lb. This is repeated for two to four days. If the cow is still septic, one half of the amount is given for one to four days longer. It appears to be safe and desirable to employ large doses of fluid extract of nux vomica or strychnine, either alone or along with chemotherapy. If cows will not take nourishment, we often give them several quarts of warm milk through a stomach tube, simply as food and to prevent dehydration.

The treatment of retained placenta in mares presents several points of interest. The best time for removal, according to Jennings,[9] is not sooner than 12 hours *post partum*. Heatley[21] states that removal at 10 to 16 or 20 hours gave the best results. He also mentions that uterine intussusception may accompany retained placenta, but is seldom a serious complication. In three cases of retained placenta with uterine intussusception that I have observed, replacement was possible in two and impossible in a third. The first case that I saw was a Thoroughbred mare at Lexington, Ky. She showed no ill effect from removal of the placenta and failure to replace the telescoped mass of the nongravid horn of the uterus. This mare delivered a live foal three years later. I[22] have described another that was replaceable after the placenta was removed. She recovered. The third case was a 3-year-old purebred Percheron mare whose dam I treated for retained placenta at the time of her birth. This maiden mare delivered dead twins at term in 1940. She had dystocia and a bad retained placenta, but recovered promptly. Dr. W. J. Gibbons handled the case, using manual removal at 12 hours, sulfanilamide by the mouth and pituitrin subcutaneously. She conceived at a single service two months later and delivered a normal stud foal at pasture on June 4, 1941. Twenty-four hours later she had laminitis and the right, nongravid uterine horn was intussuscepted about 15 in. into the uterus. This was, no doubt, the result of a partial retained placenta in the small or nongravid horn. The intussuscepted horn was replaceable only by working bimanually, pulling on the right broad ligament with one hand per rectum, while squeezing the apex up and back with the other hand in the uterus. The uterus was swabbed and sulfanilamide inserted. Pituitary extract was given intravenously and sulfanilamide orally. The vulva was temporarily closed by clamps over the upper half (fig. 4). The feet of the mare were kept in cold water and recovery was prompt.

Fig. 4. Location of temporary metal sutures that may be put in following treatment of a mare for retained placenta. A mare may recover nearly as well without these, but the genitals will require less treatment and will be in better shape for breeding 30 days after foaling if this is included as part of the method of handling.

The case description illustrates our procedure. While the closing of the vulva by clamps after handling retained placenta in the mare is not necessary, we feel that it has value in preventing wound infection from the aspiration of feces and contaminated air. It also tends to prevent treat-

[21]Heatley, T. G.: Vet. Rec., xlviii (1936), pp. 760-761.

[22]Fincher, M. G.: Cornell Vet., xx (1930), p. 316.

ing the uterus too often. The clamps may be removed and uterine douching employed. Exudate may be removed by a siphon or swabs and the clamps replaced.

SUMMARY

1) A review of the theories regarding the etiology of retained placenta is given, with the suggestion that perhaps less than one third of such cases are due to *Brucella abortus* and the rest to a great variety of possible causes. Prevention is based on the use of our present knowledge of the causes. Prevention by hormone therapy is worthy of a further trial in very valuable herds.

2) The results of the treatment of 3,500 cases in cattle are discussed with the conclusion that the placenta should be left alone sufficiently long to allow a desirable amount of necrosis to take place. The uterus should receive appropriate local treatment.

3) In the control of septic metritis intravenous medication and chemotherapy have apparent value.

4) The closure of the dorsal part of the vulva seems to be beneficial in the treatment of retained placenta and metritis in the mare.

A New Technic in Conchal Hematoma of the Dog

Having had poor results from the usual procedures due to wrinkling of the ear flap, the author* tried a new intervention.

After clipping both faces of the ear, the tumor is incised and the cavity gently curetted aseptically. A pad of cotton is molded over the incision to keep the ear flap in shape and four layers of a 3-in. plaster of paris gauze are wrapped about it. The ear is held over the forehead as the plaster hardens to the shape of that surface and then bound to the head with a bandage. When removed a week later, the incision has healed and there is no wrinkling. Satisfactory results were obtained in three cases.

*Anderson, G. L.: A method of treating haematoma of the dog's ear. Vet. Rec., xxxvii (Sept. 13, 1941), p. 540.

A Further Note on Diagnosis and Treatment of Bovine Trichomonas Infection

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IT HAS BEEN stated on several occasions that "the trichomonads are present in the male urogenital tract" or that "treatment of infected males is not advocated and disposal is recommended." In the light of our present knowledge, such statements must be considered incorrect.

If no treatment is undertaken, a mere recommendation of disposal will usually result in further use of the animal in question, possibly for service, at least for some time. In this way the active focus of infection and its only vector in the herd or district are effectively being maintained.

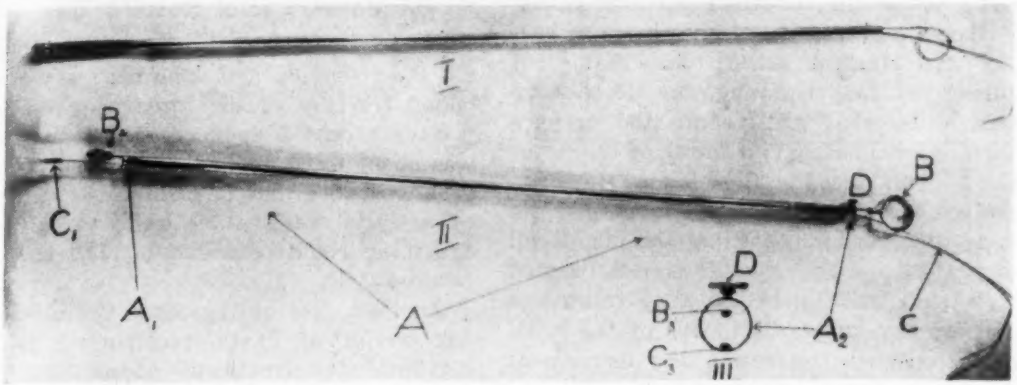
That *Trichomonas bovis (fetus)* does not at any time inhabit the male urogenital tract proper has been established.[1] Upon this fact successful treatment has been based.[2] The infective organism prefers subsistence in the superficial cell layers of the stratified squamous epithelium of the preputial mucosa. During periods of active inflammation it is particularly numerous among the many irregular folds where the parietal membrane turns onto the penis, and, by reason of proximity, in the crevices of the region of the glans penis, adjacent to the orifice of the urethra.

Now that we have the choice of either Benesch's epidural or Farquharson's paravertebral anesthesia the treatment of the disease[3] is comparatively simple, once the condition is diagnosed. If executed with due care, the treatment will yield success well worth the trouble. If undertaken in a slipshod manner, it will almost inevitably

[1]Abelein, R.: Die Trichomonadenseuche des Rindes. Deut. Tierärztl. Wochnschr., xlii (1934), p. 449.

[2]Swangard, W. M.: Trichomoniasis in cattle. Vet. J. (London), xciv (1938), No. 12.

[3]Swangard, W. M.: Trichomoniasis: biological studies and a system of control. J.A.V.M.A., xcv (1939) pp. 146-151.



I. Sampler closed.
II. Sampler opened.
A: Tubular rod 25 in. long with diameter of 1/4 in.
A_1: Slightly flared distal opening of A, with thickened rim to eliminate cutting edge.
A_2: Sealed proximal end. (See diagram III.)
B: Strong, rigid rod with ring handle on proximal end.
B_2: Distal end of rod B with plug to fit snugly into tube A, providing tight seal. Note shape of exterior part of plug.
C: Stiff but flexible wire (proximal end a few inches extra length).
C_1: Distal end of wire C with small brush soldered on (good quality shaving brush bristles).
D: Set screw to lock B (and distal plug) into position when fully retracted.
III. Diagram of proximal end of tube A (A_2).
D: Set screw within 1/4 in. of proximal end of tube A.
B_3: Inlet just large enough to permit rod B to slide.
C_3: Inlet just large enough to permit wire C to slide.

be followed by disappointment. A detailed description can be found in a previous publication. In connection with this it must be pointed out that the trypaflavin concentration of the salve should be 0.4 per cent rather than the one given in the original publication. The seemingly small difference obviates a great deal of consequent irritation and is ample for the purpose.[2]

During some months past a substrate has been sought to facilitate shipments of mucus samples for laboratory diagnosis. Due to the extreme fastidiousness in regard to nutrient mediums and the great thermolability of the organism *in vitro*, experiments have not been successful. This lack of laboratory aid can be overcome, however, by diagnosis *in loco* with the help of an instrument described below and a microscope of moderate efficiency (possessing low and high dry objectives) plus the necessary slides and coverslips.

The author has had the instrument made to specifications by surgical instrument makers in the United States and Canada. The material used was brass, chromium plated or stainless steel, the cost between eight and ten dollars.

The purpose of the instrument is to obtain an uncontaminated sample of mucus from the region described above as the preferred habitat of the organism. In the female the corresponding location is the membrane of the fornix or, should the cervix be open, the cervical and uterine mucosa.[1] The instrument is equally useful in obtaining samples from either sex, and it is easy to manipulate. Shown in figure 1, the sampler is closed and may be sterilized by boiling or autoclaving. The latter is preferable, as the instrument can be wrapped in paper previously and may remain absolutely sterile until used. If an autoclave is not available, the author either boils the samplers directly before use (at the farm) or keeps two of them in a spe-

cially made tin container already boiled. Without the necessity of anesthesia or special restrainment other than that used during ordinary handling, the closed sampler is inserted gently into the prepuce until approximately two thirds of the latter has been traversed by the rounded tip. Then the set screw D is loosened to permit rod B to slide forward, opening the distal end of the tube. The wire C is now pushed forward 1 to 2 in. and slightly rotated to pick up the sample by means of the small brush. Before retracting the instrument the brush must be returned to the tube and the instrument closed again by means of retracting rod B completely and locking of the set screw. The sample is now withdrawn within the tube, protected from contamination and is examined within one-half hour under the microscope.

It is best to use an ordinary noncorrosive microscope slide 25 by 75 mm. Upon it a good sized drop of the whitish mucus is deposited by gentle pressure with the narrow edge of a second slide on the brush. This drop is then covered with a standard coverslip and first examined under the low dry objective for the presence of the motile organism. The slide must be examined systematically and thoroughly. Sometimes several drops have to be examined before a faint spastic movement of a circumscribed area can be detected. At other times the organism itself may be discerned already under low power. The high dry lens is then focused on the suspected spot, and if the organism is present, it can be readily identified after a little practice. Rhythmic spasms are followed by shorter or longer rest periods. The powerful contraction of the "dorsal fin" and the resulting whip-like forward movement of the ovoid body is unmistakable. Often the tail-like flagellum is visible, but rarely other details.

Since ruminants harbor a saprophyte—*T. ruminantium*—in their intestinal tract, it may be pointed out here that the latter does not possess the undulating membrane ("dorsal fin") so characteristic of *T. bovis (fetus)*. The investigator, however, is unlikely to pick up the saprophyte by means of the described instrument.

Prolonged Artificial Respiration

A 25-lb. dog received 5 gr. of nembutal for the reduction and treatment of a compound fracture of the forearm. The respirations ceased suddenly when the cast was about to be applied. The heart action remained good, but it required 63 minutes of artificial respiration b e f o r e natural breathing could be induced. The dog recovered fully.

Another case of the same genre was a fox terrier of 21 lb. receiving 4 gr. of nembutal for treatment of an otorrhea. After 30 minutes, respiration ceased. Artificial respiration had to be continued for 70 minutes to restore natural breathing. The dog recovered apparently unharmed by the ordeal.—*G. H. Arthur, University of Liverpool. The Veterinary Journal, March 1941.*

A Laudable Departure in Horse Breeding

In the southwest corner of Arizona, high up near the continental divide, at the headwater of several streams, there is located a horse ranch of outstanding importance. It is known as the Lanteen Arabian Foundation; the address, Hereford, Ariz.

Rainfall, forage crops and sunshine are ample. Winters are clear and warm, summers rainy and cool. Here, in what is called the finest year-around weather in the United States, the Foundation is breeding purebred Arabians to off-colored mares with the object of producing half Arab Palominos of beautiful golden coats with white manes and tails. The ranch also has procured a band of Pinto brood mares to produce half Arabian Pintos. These crosses are producing the action, carriage, intelligence and lovable disposition for which the Arabian horse is famous. Although the company is primarily engaged in the production of endocrine products, its horse-breeding adventure has become nationally famous. The demand for Palominos far exceeds the supply. As parade horses, no breed or coloring is more popular.

CLINICAL DATA

Baby chicks consume more cod liver oil than human infants.

Folic acid is the eighth vitamin B fraction to be discovered. It takes its name from "folia," or leaves.

There is a growing suspicion that the puzzling "virus pneumonia" (human) of recent years is psittacosis contracted from barnyard pigeons.

The dangers lurking in spoiled sweet clover hay are always kept in mind by alert practitioners, especially when about to perform a surgical operation.

Except as they affect the bacterial complications, there is no scientific basis for the use of sulfonamide drugs in equine influenza. Microbic life within the cells is sheltered from the action of these drugs.

Practitioners of the goiter belt, meaning the region of sparse iodine values in food and water, in dealing with deficiency diseases, do not forget the part iodine plays in the biologic processes of higher life. The Great Lakes is the center of a vast iodine-deficient territory.

For the fall outbreaks of enterohepatitis (= blackhead) of turkeys, mapharsen, described by Bolin and Vardiman in the March 1941 issue of the JOURNAL, should be tried. The results obtained by these workers seem significant. In the new U.S.P. XII, mapharsen will be renamed metarsen.

Intoxication varying from mild to serious to lethal may follow the use of sulfathiazole. Urticarial, erythematous, macular, papular, nodular and purpuric eruptions have been encountered. A fatal case of exfoliative dermatitis from that cause is reported in *The Journal of the American Medical Association* of Aug. 23, 1941.

Although the transplacental passage of drugs varies in different species, the harmful effects (stunting and death) of sulfanilamide on the fetuses of rats, shown in experiments carried out at Johns Hopkins University, indicate that this drug should be given with caution in pregnant animals.

The practicability of transporting semen long distances was already demonstrated in 1936, when the Animal Research Station of Cambridge University (England) sent a flask of ram semen to Warsaw, Poland, for use at the Zoölogical Institute of Borowina. The journey took two days and three hours. Two ewes were inseminated. One aborted and the other produced a male lamb.

Urinary calculi in sheep are known to be one of the effects of avitaminosis A, and since it was feared that fish oils would taint the carcass with a fishy flavor, the Nebraska Agricultural Experiment Station, in working on drouth-resistant sorghum crops, found that as little as half a pound of alfalfa hay per day prevents death losses in feeder wethers from this cause.

Military horses which fell lame at the rate of six to eight daily were reduced to one or two daily by treating them for osteoporosis by supplementing their feed with daily doses of calcium carbonate, bone meal and Epsom salt over variable periods. The supplement consisted of calcium carbonate, 1 oz.; bone meal, 1 oz.; and Epsom salt, 2 oz.—*V. D. Ratman, Indian Veterinary Journal, July 1941.*

Treatment of Percheron Horses for Gastrointestinal Parasites with a Phenothiazine-Carbon Disulfide Mixture*

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FOR MANY years losses due to gastrointestinal parasites in horses have been recognized in Illinois. To assist in their suppression the Extension Service of the College of Agriculture initiated a state-wide program of horse parasite control in 1930. Supplementing the program of sanitary management, veterinarians successfully treated large numbers of horses for bots and large roundworms with carbon disulfide while oil of chenopodium was employed for strongyles. Although these remedies proved efficacious in critical tests when given separately, in combination both proved ineffective (Thorp and Graham[1]). The additional work of administering separate remedies at different times made it apparent that any effective remedy or combination of remedies that might be safely administered to horses in a single dose for the treatment of bots, large roundworms and strongyles would expedite treatment. In this report the experimental use of a phenothiazine-carbon disulfide mixture in treating horses for these parasites is discussed.

Since Harwood, Jerstad and Swanson[2] introduced phenothiazine as an anthelmintic treatment in swine, this drug has been employed with good results in the treatment of parasitisms in many species of domestic animals. Harwood, Habermann, Roberts and Hunt[3] reported that phenothiazine was very effective against horse strongyles, and this observation has been amply confirmed by Taylor and Sanderson,[4] Grahame, Morgan and Sloane,[5] Lapage,[6] Knowles and Franklin,[7] Howell and Britton,[8] Errington and Westerfield,[9] Britton,[10] Boley, Levine, Wright and Graham,[11] and Habermann, Harwood and Hunt.[12] However, while phenothiazine is remarkably efficient in the elimination of strongyles, it has little effect on the horse Ascaris or on bots. Thus, in order to eliminate these three types of parasites from horses, one treatment with phenothiazine and another with a drug such as carbon disulfide, which acts against ascarids and bots, would, if effective in combination, be desirable.

In a preliminary experiment (Boley, Levine, Wright and Graham[11]) encouraging results were noted following the treatment of 20 horses with a phenothiazine-carbon disulfide mixture by capsule. Ten of these animals were infected with Ascaris, with egg counts (Stoll method)

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[1]Thorp, F. Jr., and Graham, R.: Common parasites of horses. Illinois Agr. Exp. Sta. Circ. 397 (1932).

[2]Harwood, P. D., Jerstad, A. C., and Swanson, L. E.: The efficacy of phenothiazine for the removal of ascarids and nodular worms from swine. J. Parasitol., xxiv (1938), pp. 16-17.

[3]Harwood, P. D., Habermann, R. T., Roberts, E. H., and Hunt, W. H.: Preliminary observations on the effectiveness of crude unconditioned phenothiazine for the removal of worms from horses. Proc. Helminth. Soc. Washington, vii (1940), pp. 18-20.

[4]Taylor, E. L., and Sanderson, K. M.: Phenothiazine—a remarkably efficient anthelmintic. Vet. Rec., lii (1940), pp. 635-647.

[5]Grahame, T., Morgan, D. O., and Sloane, J.: Report on phenothiazine as an anthelmintic in horses. Vet. Rec., lii (1940), pp. 660-663.

[6]Lapage, G.: Experiments on the anthelmintic action of phenothiazine. Vet. Rec., lii (1940), pp. 648-657.

[7]Knowles, R. H., and Franklin, A. V.: Treatment of equine strongylosis by phenothiazine. Vet. Rec., lii (1940), pp. 663-664.

[8]Howell, C. E., and Britton, J. W.: A field trial with phenothiazine as an equine anthelmintic. Cornell Vet., xxx (1940), pp. 526-532.

[9]Errington, B. J., and Westerfield, C.: Phenothiazine as an anthelmintic for horses and mules. Vet. Med., xxxv (1940), pp. 688-693.

[10]Britton, J. W.: Phenothiazine therapy in draft horses. Cornell Vet., xxxi (1941), p. 85.

[11]Boley, L. E., Levine, N. D., Wright, W. L., and Graham, R.: Phenothiazine in the treatment of gastro-intestinal parasites of animals. Ann. Rpt. Ohio State Vet. Med. Assn. (1941), pp. 25.

[12]Habermann, R. T., Harwood, P. D., and Hunt, W. H.: Critical tests with phenothiazine as an anthelmintic in horses. No. Amer. Vet., xxii (1941), pp. 85-92.

ranging from 133 to 1400 per gram of feces. After a single treatment with 45 Gm. phenothiazine and 15 to 24 cc. carbon disulfide (depending on the animal's weight), no ascarid eggs were found in 7, and from 33 to 100 per gram in the 3 others. Similarly, 18 of the horses were infested with strongyles, with egg counts ranging from 67 to 3150 per gram. One week after treatment, only 2 horses continued to pass strongyle eggs, and their numbers had been reduced to 33 and 267 per gram respectively. Strongyles, ascarids and bots were observed in the feces following treatment.

Since Errington and Westerfield[9] had reported that phenothiazine markedly lowered the erythrocyte counts in some treated horses, pre- and post-treatment hemoglobin determinations were made (Newcomer method) on 18 of the horses, but no significant differences were observed. However, a post-treatment anemia was observed in a number of other horses following treatment with phenothiazine alone.

The present observations were carried out on 23 nonpregnant Percheron mares and one 4-year-old Percheron stallion. Before treatment fecal samples were collected, and the numbers of ascarid and strongyle eggs were determined by the Stoll technic. Blood hemoglobin was determined by the Newcomer method. Since Errington[13] reported anemia, albuminuria and hemoglobinuria in horses following administration of therapeutic doses of phenothiazine, it was considered advisable to check the urine of the treated animals. Pre-treatment urine samples were obtained for study by catheter from all the mares, but not from the stallion. The urine samples were examined* for sugar (Benedict's test), albumin (Roberts *et al.* test), ketones (Rothera test), erythrocytes, hemoglobin (hemin and spectroscopic tests), bile salts (sulfur surface tension test), and reaction (litmus test).

Forty grams of phenothiazine were placed in 3 one-ounce gelatin capsules in the laboratory. Just prior to administration the tops of the capsules were removed and 8 cc. of carbon disulfide added to the phenothiazine in each capsule. The resulting mixture* was a dark green mass similar in consistency to the carbon disulfide mass capsule. When the tops were replaced the dry phenothiazine in the caps absorbed the liquid carbon disulfide present. Each capsule was lubricated with a few drops of mineral oil just before administration with a balling gun. Preceding the treatment all horses were fasted for 36 hours.

Three days after treatment, urine samples were again collected from the mares by catheter and examined as before; and a week after treatment hemoglobin determinations and ascarid and strongyle egg counts were made and the urine was reexamined.

Before treatment, ascarid eggs were found in 13 of the horses, their numbers ranging from 33 to 1800 per gram of feces. One week after treatment, ascarid eggs were found in the feces of only 3 of the animals, and their numbers ranged from 67 to 850 per gram (Table I). Another egg count made 2 weeks after treatment on the last horse (with an ascarid egg count of 850 per gram 1 week after treatment) revealed no ascarid eggs.

Before treatment, strongyle eggs were found in all 24 horses, their numbers ranging from 100 to 5060 per gram of feces. One week after treatment, strongyle eggs were found in only 5 of the animals, and their numbers ranged from 33 to 67 per gram (Table I).

Before treatment the blood hemoglobins of the horses ranged from 9.36 to 15.68 Gm. per 100 cc. of blood. One week after treatment, the blood hemoglobins ranged from 9.57 to 15.43 Gm. per 100 cc. (Table I). There was, however, a marked shift in the hemoglobin levels of some of the horses. The hemoglobins of 10 animals increased from 0.08 to 4.54 Gm. those of 13 animals decreased from 0.11 to 4.98 Gm. while that

*Blood and urine analyses were conducted under the direction of Dr. Jesse Sampson.

[13]Errington, B. J.: Phenothiazine as an equine anthelmintic. Vet. Med., xxxvi (1941), pp. 188-193.

*The phenothiazine - carbon disulfide mixture was prepared in the open air by one of the authors (LEB) to prevent inhalation of carbon disulfide fumes.

TABLE I—Treatment of Percheron Horses for Gastrointestinal Parasites with Phenothiazine-Carbon Disulfide

Horse	Pre-treatment			Treatment	7 Days After Treatment			Shift in Hemoglobin
	Egg Counts*		Hemoglobin†		Egg Counts*		Hemoglobin†	
	Ascarid	Strongyle			Ascarid	Strongyle		
1	0	100	11.82	40 Gm. phenothiazine and 24 cc. carbon-disulfide each by capsule after 36-hour fast	0	0	11.38	—0.44
2	67	500	10.71		0	0	15.25	+4.54
3	0	800	11.00		0	33	11.71	+0.71
4	330	1100	11.38		0	0	11.38	0.00
5	67	230	11.71		0	0	14.90	+3.19
6	0	1960	12.51		0	0	12.40	—0.11
7	0	567	9.36		0	0	12.63	+3.27
8	0	2600	13.33		0	0	15.43	+2.10
9	0	1900	9.95		0	0	9.57	—0.38
10	1100	900	11.29		850§	0	14.03	+2.74
11	0	700	11.00		0	0	10.36	—0.64
12	267	1700	9.71		0	0	9.79	+0.08
13	830	2260	10.11		0	67	10.44	+0.33
14	230	5060	9.71		0	0	12.05	+2.34
15	0	4160	10.71		0	0	11.29	+0.58
16	100	870	11.00		0	0	10.11	—0.89
17	33	370	15.60		0	0	11.38	—4.22
18	0	500	15.60		0	0	10.62	—4.98
19	0	133	14.73		0	0	10.44	—4.29
20	0	3760	14.90		0	33	11.29	—3.61
21	700	667	15.78		67	33	12.17	—3.61
22	1800	600	15.25		333	33	13.19	—2.06
23	967	300	15.78		0	0	13.05	—2.73
24‡	100	830	13.33		0	0	12.17	—1.16

*Eggs per gram feces (Stoll technic).
†Grams of hemoglobin per 100 cc. of blood (Newcomer method).
‡Stallion; all other animals were mares.
§Egg count 2 weeks after treatment showed no ascarid eggs in feces.

of one horse remained constant (Table I). The average shift in hemoglobin one week after treatment was —0.39 Gm. per 100 cc. of blood.

Before treatment, all urine samples were negative to sugar, albumin, ketones, erythrocytes, hemoglobin, and bile salts and were alkaline in reaction. Three and seven days after treatment, urine analyses gave the same results on all horses. In other words, no abnormal changes were detected in the urine.

Ascarids, strongyles and bots were passed by the horses following treatment, but no count was kept of their numbers. No symptoms were noted in any of the animals following treatment.

To date, 44 horses have been treated with a phenothiazine-carbon disulfide mixture for the simultaneous removal of ascarids, strongyles and bots. The mixture exhibited a high degree of efficiency against ascarids and strongyles, as judged by egg counts, and many bots were also passed after treatment. Although the blood hemoglobin of some of the horses decreased following treatment, that of others increased markedly. In fact, the average post-treatment hemoglobin level was not significantly different from the average pre-treatment value. No evidence of kidney damage was observed in the 23 mares on which urine studies were made.

It must be recognized that the use of egg counts to establish the efficacy of an anthelmintic has certain disadvantages, since there is always the possibility that the drug may simply stop the egg-laying activity of the females and not actually kill them. Hence further observations by means of critical tests involving worm counts at autopsy would be desirable for final appraisal of the anthelmintic properties of pheno-

thiazine-carbon disulfide and also to establish its range of safety.

SUMMARY

A mixture of phenothiazine (40 Gm.) and carbon disulfide (24 cc.) was administered in capsules to 24 Percheron horses following a 36-hour fast. No clinical evidence of illness was observed following the treatment.

Pre- and post-treatment fecal egg counts indicated that ascarid and strongyle eggs were eliminated or greatly reduced, while these two parasites as well as bots were observed in the feces of the horses following treatment.

Pre- and post-treatment examination of blood and urine of the treated horses revealed no significant evidence of anemia or kidney damage.

Eggs in Food Inspection

Manure-soiled eggs are no more to be overlooked in food inspection than manure-contaminated milk. Quality eggs are as much a veterinary problem as quality milk. Both of these major sources of animal protein (and other components) have their economic and hygienic side. They concern human health and farm income.

In the field of public health, dirty eggs have not been studied to the same extent as dirty milk. Details remain to be explored. While the shell of an egg provides more protection against mass contamination than the open milk pail, the contents are by no means hermetically sealed and the fecal-strewn surface of a "dirty" egg is a vehicle for bacteria from henhouse to kitchen. Although not habitually consumed raw, soiled eggs contaminate the hands of the cleanest chef and some raw eggs are used in beverages, salad dressings, ice cream, *et al.* The diseases transmitted, with tuberculosis left out, would range among the food poisonings.

This thesis, however, mainly concerns the economic side. In the drive to encourage veterinarians to take more interest in the poultry problems of the American farmer, the economic side of egg production should not be skimped. An expert* has just pointed out that although Iowa farmers produced 360 million more eggs than California in a given year, California poultrymen received $1,260,000 more than the Iowa farmers during the same year. That is a lot of pin money to take from the housewives of rural Iowa. The main cause of the deficit was that California eggs were clean, and Iowa eggs dirty—nest soiled. Other tricks of successful egg production are prompt gathering, immediate cooling and marketing without delay.

Moreover, heavy losses come from bad-tasting eggs. These are probably tremendous. One disgusting egg can turn a consumer away from eggs for months, if not forever. Stomachs none too receptive to egg protein revolt against unsavory eggs. Those who know the taste of the kind laid in clean nests by well-fed and well-housed hens abhor the tainted kind and will go from market to market until they find the quality they want. Those who have known only the too common tainted variety of the grocery store are not apt to cultivate an appetite for eggs.

The fact that *per capita* consumption of eggs in the United States is but 225 is proof that Americans are not famous eaters of that food. This figure includes those used for every purpose and in every way: baking, drying, hatching, etc. The poultryman's objective is higher consumption, especially for breakfast, and that can be accomplished only by improving quality.

Veterinarians bent upon advising farmers in this respect will find that the change is easier said than done. Farmers can not be expected to "clean up" until they are rewarded for doing so. The average farmer who produces clean, savory eggs gets the same price from the shipper as the one who produces the manure-soiled kind, for the reason that the shipper can not afford to sort a few good eggs from the bulk of "dirties." Reform is, therefore, a regional (community) problem where the shipper would find a sufficient number of "specials," "extras" and "standards" to justify grading.

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*Galer, Frank. You lost seven million dollars. Successful Farming, xxxix (July 1941), pp. 18-19.

The First Stopping Place of Liquid Drugs Given to Ruminants

IN RUMINANTS INFECTED with stomach worms, for example, the dynamics of the drug depend a great deal upon its dilution in the mass of food the complex stomach of the ruminant contains. Whether the drug flowed into the fore stomachs or went directly back into the abomasum where the worms are nesting is a paramount issue.

Since the birth of veterinary physiology in the middle of the past century, numerous experiments have been made to show whether liquids may pass directly into the true stomach. Milk of the suckling is a well-proved example of direct delivery of a liquid into that compartment. It is commonly taught, however, that as the young ruminant grows older, an age is soon reached when all liquids flow first into the fore stomachs before proceeding further. The effect of stopping there on the action of a drug intended to harass parasites by contact is self-evident.

The nature of the agent given, its temperature, the rapidity of intake (thirst, drenching, volume of the swallows) and other factors have been mentioned by physiologists as having some influence as to whether a liquid will go directly to the abomasum or stop off on the way. But, in any review one can make of the question, the physiology of deglutition in the ruminant is found to rest where it was left by the experimental work of Colin[1] over 80 years ago. With his hand in the rumen of an animal drinking, Colin detected that in adults, the manyplies was shut against the flow of liquids beyond the esophageal gutter.

Experiments carried out in Australia, in sheep, appear to establish new facts in this connection. Working with water-acacia suspensions of barium sulfate and fluoroscope, Watson[2] showed that the mechanism of deglutition in sheep does provide for the passage of liquids directly to the abomasum, not only in suckling animals as was formerly believed, but also in test sheep up to 4 years old.

Lambs taught to take the test suspension by sucking a rubber teat, or by the injection of the suspension into the udder of the ewe, were used to establish the fact that direct delivery to the fourth compartment is of common occurrence. In weaned lambs, milk or the suspension went into the forestomachs along with the water drunk, but in weaned lambs which were again taught to suckle after periods of spontaneous drinking, the suckled liquid went into the abomasum. This change in the path taken by the suspension given, therefore, corresponds to the desire to suckle, for after the lambs began to drink water spontaneously, usually all liquids flowed into the fore stomachs.

The experiments also showed that in drenching adult sheep there were individual variations. In some sheep the suspension always passed into the abomasum, completely or partially, while in others it rarely did so. Moreover, individuals changed. Whereas they may have swallowed directly to the abomasum for a time, they later ceased to do so. A revealing observation was the fact that when the suspension was given through the nose, it went into the fore stomachs, while the destiny of suspensions given in the fore part of the mouth was generally the abomasum. Obviously, the oral reflexes are dominant factors in governing the activity of the esophageal gutter. The influence of suckling and of oral intake appear to support that conclusion, as does also the allegedly successful practice of giving a sheep a small swallow of a strong solution of copper sulfate just before drenching with the weaker solution.

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[1]Traite de Physiologie Comparée des Animaux, by G. Colin. i (1871), pp. 624-631.

[2]Watson, R. J.: Studies on deglutition in sheep: a résumé of observations in the course taken by liquids through the stomach of sheep at various ages from birth to four years. Australian Vet. J., xvii (Apr. 1941), pp. 52-58.

Corneal ulcer, keratitis and chronic corneal opacity responded in eight human cases to daily intravenous injections of 500 mg. of ascorbic acid.—*Medical Times, Sept. 1941, p. 408.*

An Extended Study of Female Offspring of Positive Bang's Diseased Cattle*

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DURING THE PAST seven years we have built up a herd of 56 females from dams that had positive reactions to the agglutination test for Bang's disease.

There has been some controversy concerning the possibility of building up a clean herd of female offspring of positive dams. There is the possibility that the organism might be harbored in the lymph glands of the daughter, lying dormant during calfhood, but resuming activity with the beginning of the breeding cycle. There is also the question of the mode of transmission of the infection from dam to daughter: whether prenatally by placental transmission, or postnatally by association with the dam or by ingesting infected colostrum.

Our herd was studied to observe whether prenatal or postnatal exposure of a calf would result in infection, and if so, whether the calf would carry such an infection through to maturity and then, when in early reproductive life, suddenly begin to disseminate the disease. In order to determine the amount of exposure of each calf to *Brucella abortus*, the placenta and colostrum of the dam were examined in each case. *Br. abortus* was recovered from the placenta of 19 and from the colostrum of 44 of the 56 dams. The building up of such a herd of females was a tedious process and at times discouraging, especially during those years when the calf crop consisted largely of males. Abortion and calfhood diseases were also stubborn barriers.

When a heifer calf was born of a positive dam, if possible a blood sample for an agglutination test was obtained from the calf before it nursed. For the first week the calf was allowed with its dam twice daily to nurse. After that week it was fed milk from negative cows. When its blood titer became negative, the calf was given an antiseptic bath and moved from the infected barn to a barn reserved for the herd made up of offspring of dams with positive titers.

After this removal, blood samples were taken only once a month. When the calf had reached maturity and completed her first gestation, the milk was examined for *Br. abortus* on an average of every three months during lactation. The colostrum was examined after each parturition. Samples were collected from each quarter of the udder in separate 500-cc. containers, which were placed in the refrigerator for approximately 24 hours to allow the cream to rise. Two guinea pigs were inoculated with 5 cc. of gravity cream from each quarter, a total of eight guinea pigs being used for each milk or colostral examination. The whey obtained by adding rennet to a 5-cc. sample of milk from each quarter was tested for agglutinins. *Br. abortus* was never isolated from any of the 257 samples of milk nor from 93 samples of colostrum examined.

The placenta was obtained after each calving, with a few exceptions. Despite a vigilant watch, we occasionally failed in our attempts to collect placentas. These failures occurred when the cows calved at night and, though carefully secured, managed to devour the fetal membranes. Where there was evidence that the fetal membranes were going to be retained, a few of the fetal cotyledons were removed before putrefaction began. For examination a saline suspension prepared from pieces of chorion and cotyledons ground in a mortar was inoculated intraperitoneally into three

*Paper No. 1913, scientific journal series, Minnesota Agricultural Experiment Station; contribution from the Division of Veterinary Medicine.

†Died January 11, 1940.

'77th Congress, H.R. 5531, August 8, 1941.

guinea pigs. *Br. abortus* was not isolated from the 93 placental membranes examined.

Fifty-six cows were studied as follows:

1 through 6 lactation periods.
2 through 5 lactation periods.
3 through 4 lactation periods.
8 through 3 lactation periods.
14 through 2 lactation periods.
15 through 1 lactation period.

The remaining 13 had not yet calved. This gave a total of 95 lactation periods, from which were obtained 257 milk samples and 93 placentas and samples of colostrum.

For examining cases of abortion or of destruction of male calves shortly after birth, cultures were made of the liver, lungs, spleen and stomach contents. Two guinea pigs were inoculated with fetal stomach contents and two with a saline suspension of the lungs, liver and spleen. If any vaginal discharge was noted in the dam prior to parturition, swabs were taken from which a saline suspension was prepared and inoculated into two guinea pigs. *Br. abortus* was not isolated from the 16 calves, two fetuses, or two discharges examined. In six cases of neonatal mortality, accounted for by pneumonia, fractures, peritonitis, intestinal toxemia and pyemia, *Br. abortus* could not be demonstrated upon examination.

SUMMARY AND CONCLUSION

A seven-year study was conducted on a herd composed of 56 female calves from positive dams. Each calf was separated from the infected dam immediately and, except for nursing periods for one week, was put with the clean herd as soon as it showed a negative titer. It was then carefully observed through every lactation.

In examinations of this herd, *Br. abortus* was not isolated from any of the milk, colostrum, placental membranes, vaginal discharges, fetuses or calves that were examined shortly after birth.

This is taken as additional evidence that a clean herd can be built up from an infected herd, with no danger of later outbreak of a latent infection, if the calves are not allowed to remain in the infected herd, but are removed from the source of infection after the first few nursing periods, held until they show a negative agglutination titer, and then put in with a clean herd which is maintained under suitable, sanitary conditions. It confirms the findings made in this regard at the Oregon station (Bul. 232, June 1928).

Occlusion of Mesenteric Arteries in the Horse*

No study is more fascinating than the occlusion of the cecal and colic arteries in the horse by the action of parasites, owing to its far-reaching effect on the health of the victim. Affected horses may become veritable "hay racks" or die of impaction, bloat or cecal infarction or gangrene. The culprit is the tiny larva of *Strongylus vulgaris*. In the Midwest most horses have some degree of anterior mesenteric occlusion. Out of 150 horses completely examined *post mortem*, 120 were found to be affected. The common site was the three main branches of the short main artery. The main trunk was affected only in seven cases, three with aneurysm and four with thrombosis.

Obviously, the larvae travel in the adventitia of the vessels, as the renal and coeliac vessels would be more often attacked were the larvae to arrive *via* the arterial blood.

The ileac and middle colic arteries are seldom affected because the ileum and small colon receive important irrigation from other sources.

The pathogenesis is described as a penetration of the media and intima by larvae which cause irritation (arteritis and endoarteritis). Where the intima is damaged, a white thrombus develops amid few or many larvae. As the thrombus enlarges, it causes partial obstruction of the vessel. With the slowing of the blood stream, a red thrombus forms. The mixed thrombus then contracts and permits the blood flow to increase. Thereafter the process is chronic with thickening of the vessel walls. The aneurysm is the result of the lack of the "give and take" of normal arterial tis-

*Runnells, Russell A.: Cecal and colic occlusion in the horse. M.S.C. Veterinarian, 1 (Spring 1941), pp. 67-72.

sue. When the worms disappear, organization occurs rapidly, leaving the thickened walls with a rough, wrinkled intima which is the only remaining sign of the previous occlusion. In aged horses these scars are the only evidence of lesions which may have existed years before. They are comparable to the old foundations of buildings that have long since disappeared.

Malnutrition and recurrent attacks of colic and cecal impactions owe their origin to these lesions through atony and reduced peristalsis. Deaths of even aged horses may be traced to the presence of a verminous thrombus at the root of the cecal artery.

Methenamine in Tetanus

IN 1926, LeFevre and Millet[1] demonstrated that methenamine (urotropin) in solution is capable of carrying substances dissolved in it through the meningeal barrier, and in 1931, Assali, Lambert and Popoff[2] were the first to employ that chemical in the treatment of tetanus with that hypothesis in mind. Since Nicolaier and Kitasato (1890), the toxin of *Clostridium tetani* was known to lock itself behind the meningeal barrier and, therefore, shelter itself from the action of antitoxin. These physicians (A., L. and P.) dissolved the antitoxin with 15 gr. of methenamine in solution and injected the dose intravenously every 24 hours. Although their dosage of antitoxin was small (3,000 units*), they obtained 10 cures in 14 cases (human). The presumption was that the antitoxin was carried into the brain and cord.

A recent report by American physicians[3] revives this idea in a report on 100 human cases treated with large doses of antitoxin followed in two hours with 15-gr. doses of methenamine intravenously. The antitoxin dosage was 200,000 units given within 36 hours after hospitalization: 20,000 units locally, 40,000 units proximal to the site of infection, 60,000 units intramuscularly, 20,000 units cisternally and 40,000 units intravenously in normal saline solution, repeated in three hours with 20,000 units if there was no reaction. The methenamine solution (15 gr.) was given two hours after the first intravenous doses, and ten to twelve hours after the others.

Translating, under this new plan for use in large animals, with body weight as the criterion for dosage, 1,000,000 units of antitoxin would be required during the first 36 hours. Except for the cisternal dose which is not easy to give through the thick poll of a horse, the other methods of administration will offer no difficulty.

The American physicians above cited explain the theoretical reasons for the use of methenamine as follows, but make no reference to the previous work of their European colleagues:

a) Methenamine allows greater permeability to the antitoxin.
b) Formic acid, an antiseptic, is liberated in the blood stream.
c) The colloids of the nerve cells are altered.
d) Methenamine has some unexplained action on tetanus antitoxin.

Whatever may be the mechanism, the reduction of the mortality of 100 cases more than 56 per cent is not less significant.

The intravenous administration of about 60 gr. of methenamine in solution, following antitoxin, to large animals suffering from tetanus seems to be a useful and scientific procedure.

*The unitage of European tetanus antitoxin is not computed on the same basis as in this country.

[1]Haver Glover Monthly Messenger, xii (Dec. 1932), p. 12.

[2]Assali, Lambert and Popoff: Bul. Soc. Path. Exot. xxiv (1931), pp. 590-595.

[3]Vener, H. I., and Bower, A. G.: Clinical tetanus: treatment in 100 consecutive cases with a net mortality of 19 per cent. J.A.M.A., cxvi (Apr. 12, 1941), pp. 1627-1631.

The "salt treatment" for enteritis in hogs is one of the newest therapeutic methods of Corn Belt swine practice. Swine affected with dysentery are given all of the salt-soaked oats they will eat twice a day for four days, and no other feed during that time. A rest on normal feed for three days and a repetition of the treated oat ration generally completes the treatment. The strength of the salt solution used is 10 lb. to 50 gal.—*From Veterinary Medicine.*

EDITORIAL

The Beef of Argentina*

BECAUSE THE JOURNAL has hesitated to interject its views on the Argentine beef dispute, a flood of letters from the Midwest and Intermountain States expressing regret at the Association's silence has been received. One of them contains a resolution deploring (and we quote) "relaxing our vigilance in preventing the introduction of foot-and-mouth disease and letting in the equivalent of a million cattle in competition with our cattlemen."

The reason for hesitating is self-evident. Except for approving, at the Indianapolis meeting, a regulatory measure[1] before the present Congress, the Association *per se* has not framed a policy on the subject. Moreover, it would not be logical for the JOURNAL to overstep the purely technical limits of the facts concerned. Note how in the above quotation, "foot-and-mouth disease" and "competition with our cattlemen" fall smoothly into the same sentence. Preventive veterinary medicine and international trade relations go into the same thought. Only the scientific phase of such debates belongs in a journal aiming to voice a profession's views. So, perish the notion that the silence spells indifference. Thanks to officials of the U. S. Bureau of Animal Industry, all available data concerning the danger to our livestock industry and public health from the proposed beef imports are on file in the Association's archives, namely, (1) the disease potential of South American livestock, (2) the latest information on the livability of foot-and-mouth disease virus and (3) the measures that are apt to be taken when and if the Congress passes the enabling legislation.

FAULTS ON BOTH SIDES

Material at hand seems to indicate that American veterinarians and cattlemen are telling the whole world that Argentine livestock and their products are disease-ridden agents. Erroneously translated, our arguments seem to be pointed out in South America as attempts of our cattlemen to injure the business of a friendly nation in order to further their own interests. Although more thoughtless than intentional, damage is claimed to exist.

On the other side, it is evident that Argentine spokesmen are dodging the main issue—our never-lapsing effort to keep certain animal diseases out of this country, come what may. That certain animal diseases, of which foot-and-mouth disease is but one, could wreck the nation is an unchangeable teaching of our veterinary service. Healthy livestock is America's hope, animal disease its pyre. Outlets for manufactures weighed against the health of our domestic animals are as light as a feather. In longtime planning for national security, our small group invites analysis of its contention that animal disease is the world's greatest threat.

While the carefree populations of the New World multiplied, exuberant pastures and abundant crops kept animal diseases in ambush as a national problem. What mattered a few herds of dead animals while others thrived in abundance! The impoverishing animal plagues of the Old World preceding the days of systematic control had not impressed the pioneers. Until the enemies of livestock (worms, bacteria, viruses, insects, toxic plants) began to take command, abundance took the place of sanitation. Congress laughed at the idea of forming a veterinary service in 1884, and later a comparable situation was develop-

*This article is written in reply to numerous complaints about the alleged inertia of the Association on a matter of international importance involving the veterinary service.

[1]77th Congress, H.R. 5531, August 8, 1941.

ing south of the Equator. Nations attempted to develop animal production on "exuberant pastures" without building up, contemporaneously, a livestock sanitary service. At the turn of 1940, a veterinary journal[2] published in Buenos Aires stated:

> While much progress has been made in livestock production from the zoötechnic standpoint in Argentina, this is not true in respect to disease control. The latter is probably due to the fact that there has been such an abundance of rich pastures and foreign markets that it was not necessary to consider losses from various diseases so seriously. Present world conditions, however, have reduced market possibilities and have increased competition, each change having rendered the livestock business difficult. In turn, this has made it necessary to abandon the old system of closing one's eyes to disease conditions and to consider seriously measures to control epizoötic maladies.

The article goes on to complain that when the National Foot-and-Mouth Disease Institute was established, it was supposed to be a step in the right direction, but the effort was carried out with such timidity that the Institute has been a failure. The author pronounces the failure lamentable, not only in itself, but also because it will discourage others who undertake similar work that should be accomplished.

Other Argentine journals have criticized the work of the Foot-and-Mouth Disease Institute. *La Res*,[3] for example, publishes caustic comments on the failure to allow funds sufficient to make any kind of comprehensive progress possible. The article reproduces with illustrations parts of Paul de Kruif's *Hunger Fighters* in which the eradication of foot-and-mouth disease in California (1924) is depicted.

The danger of diplomatic services trekking on scientific terrain uncoached is reflected in a lecture, entitled "The Problem of Beef in the United States-Argentine Relations," delivered at Harvard University by Carlos Gracia-Mata, former commercial attaché of the Argentine embassy. While the accuracy of other statements made by the speaker is open to contradiction, the following quotation from the lecture seems to run particularly contrary to the known facts. We quote:

> To allow the importation of Argentine fresh or frozen meat, a change in the law will be necessary. The present embargo ought to be substituted by a quarantine or by several of the systems discovered in the past 10 years, since the passing of the American law. These systems accomplish the task of killing the virus of foot-and-mouth disease in the dead meat. The Argentine Foot-and-Mouth Disease Institute has been working on this problem for the last year and it seems real simple. As you can easily understand, if the doctors have succeeded in killing most of the virus of disease without killing the patient, they will have an easy job of it when allowed to use all kinds of tricks short of spoiling the taste of the meat. Dead flesh can stand a great deal of punishment.
>
> Therefore, it will be rather easy to adopt a quarantine and/or a system that would convince the most skeptical American veterinary, even if he comes from the West, even if he comes from Missouri, that there is absolutely no virus alive in the meat imported.

Obviously, the speaker was not coached by the veterinarians of his country, since the least "skeptical American veterinary" will be amazed at the text and tone of the argument. As to the frivolous language of the last paragraph, we are sure that our colleagues in Argentina will be no less chagrined than we. It's another case of "Father, forgive them, they know not what they do." The veterinarians of all modern nations are inured to the popular misunderstanding of their task in high places, knowing too well that general knowledge of the extent to which animal diseases govern the bourns of humanity lies in the future.

Our duty in dealing with this international dispute, as always, is to bring out the facts which knowledge and experience have taught. But these days of catyclasmic events call for sober thinking and fair play we may some day wish to enjoy at the hands of others.

Agricultura Experimental is the name of a new periodical publication (Spanish) of the Puerto Rico Agricultural Experiment Station. The current issue, Vol. 1, No. III, features the importance of agriculture in national defense.

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[2] Gaceta Veterinaria, Buenos Aires, No. 8 (Nov.-Dec. 1940), p. 163.
[3] La Res, Buenos Aires, June 20, 1941.

Cashing in on Hungry Mouths

ONE WAY OF getting our country universally disliked is for the agricultural press to go on explaining that our farmers are about to cash in on the hungry people of foreign countries.

An agricultural monthly, for example, is telling farmers that "when the fighting stops, hundreds of millions of hungry mouths of Europe, Asia and Africa will need every smidgeon of food our acres can produce."

Besides being an unkind implication, dangerous, wishful and perhaps not true, it is a repetition of the sort of advice farmers heard in 1920. The reasoning is faulty because no war ever increased the ability to buy. Granted that American farmers may cash in for a season or two on "hungry mouths," what kind of money are they going to accept? Will it be Japanese muslin, Argentine corn, French lace, German chemicals or Italian spaghetti? A great deal of the gold is here now.

The paper quoted is urging farmers to fight for "economic justice," not for subsidies nor the wise planning other enterprises do to sustain prosperity and lasting security. The fact that the land is man's only means of staying on earth and that man is wanting to have something to say about how his only source of existence is being handled is not detected as a reason that farm production is coming under the regulatory functions of government. Little do the councils of farming seem to realize the depths of the big problems they attempt to settle with a swish of the hand. The result of these swishes is farming as we have known it through all the years of American history—a vocation so unwisely coached that it begs for help today and asserts its independence tomorrow, depending upon whether the times are good or bad. Just now, with the prospect of hungry mouths to feed in the countries at war, independent action on every acre is urged. No aid wanted is the theme. The aid asked from every Congress since George Washington is not wanted just now, at least not by this prominent spokesman.

Moreover, American farmers have been led to forget that the United States is but a strip across the North American continent beyond which there is a lot of world with a lot of intelligent and cultured people to reckon with. It would be a tragedy of the first rank for our country if the present upheaval leads to nothing more than the hope of more selling to the "hungry mouths" of other populations.

The veterinary profession is interested in farming and animal production at home and abroad and acknowledges its debt to the foreign countries in distress to such a degree that its altruism can not be changed by any swirl of world events, certainly not to the extent of portraying our farmers as vultures soaring over prospective prey—hungry mouths of other people. Here again, the farmers' counsel is morally bad and economically dubious.

Foreign Veterinary Journals

In the language of the street, foreign veterinary journals are being pushed around. *Verboten* appears to be the cause, although scarcity of things and men may be a factor along with suppression of what here we call free speech. Technical literature can contain damaging truths and must, therefore, be taken out of circulation. *The Journal of the American Medical Association* denounces the medical reports of the Italian campaign in Ethiopia as pure propaganda designed to maintain morale rather than to depict the horrible health conditions of that country and of the invaders. Veterinary journals freely circulated throughout the world would surely have plenty to say in and between the lines about general welfare within the boundaries of the warring nations.

The suppressed veterinary journals of Belgium, Holland, Denmark, France and the Balkan countries are war casualties. Whether they will survive and in what form are as uncertain as the outcome of the war itself.

Two-Party System for the AMA?

PROVOKING BELIEFS that large societies are run by a system of internal politics prompt Oliver Garceau, instructor in government at Harvard, to write a book, entitled *The Political Life of the American Medical Association*, in which more rather than less politics is recommended, *to wit*:

1) More politicians within the organization.

2) Abandon the present notion of one mind and one voice of a united group.

3) Organize a two-party political system within the Association.

In regard to the third recommendation the author proposes that intramural contests be made "respectable and honorable" by bringing them to the surface, where they may be handled in the strictly democratic fashion. The remedy proposed is to rule out the taboo against medical politicians and develop more politicians: Quoting:

> The dislike for washing its dirty linen in public is understandable but there has been too great a tendency to handle all differences as dirty linen. It would be a tragedy for the whole community if the AMA did not elicit public respect. It owes to itself and to the public a better performance than it has recently achieved.

Here are thoughts for the AVMA to ponder. It has both financial and professional fences to keep in order. It deals with trade as well as with the ethical practice of a science. When from time to time our roster of officials was reorganized and the governing laws revised, the object was to bring about the very reforms Professor Garceau proposes for the AMA, that is, to set up a true democracy in the veterinary profession with leaders (politicians if you like) taking a close and active interest openly on every question confronting the Association. The machinery was set up, but we have thus far failed to elicit study and debate of matters presented. Perhaps the same fault exists in the AMA, but whether the remedy is two political parties and heated debates remains to be seen. We have our doubts. Great changes will have to come over the rank and file. It's the old, old story of society work. Willing Georges do the planning and the members do the kicking. General Pershing in 1918 said (or is said to have said), "Kicking is an American's prerogative and the life of the A.E.F." Anyhow, it is pretty much that way in professional associations.

The question that crams the mind in judging the merits of this book is, what experience has the author had in inside medical association work on a national scale? Has he taken a bird's eye picture of the medical profession and all of its complex ramifications from coast to coast and beyond? It is not as easy to run a national association in the United States as some folks think. We are a people of many minds. To attempt to please all of them—to avoid kicking minorities—is hopeless. Medical society executives and voluntary workers, including those of our small profession, in our perspective, have but two thoughts in mind: to advance medical science and to see that it is properly applied. Kicking is justifiable only when reaching either one or the other of these objectives is in danger.

"The Cattleman" for September 1941

The Cattleman of Fort Worth, popular monthly of the Southwest, published a horse number for September. Among the captivating features, of which there are many, is an illustrated history of the spur from the pre-Christian period to the present. Elsewhere one finds informative histories of horse racing, the art of riding, the bridle and bit, the saddle, the carriage, the rodeo, etc., all of which brings together 150 pages of reading material on horses that is hard to beat as a condensed compilation on so broad a subject. *The Cattleman* is congratulated for the editorial courage such an issue represents.

The traffic toll in the United States is higher than the bomb toll in Britain.

CURRENT LITERATURE

ABSTRACTS

Equine Encephalomyelitis in a Prairie Chicken

The virus of equine encephalomyelitis (western) was isolated from the brain of a prairie chicken (*Tympanuchus cupido Americanus*, Reichenbach) shot near Rugby, N. Dak., by a laboratory assistant of the U. S. Public Health Service. An interesting fact is that at the time the bird was killed (Aug. 27, 1941) there was an epidemic of human encephalitis in the vicinity of Rugby. The virus was properly identified by the conventional methods.

The eastern strain of equine encephalomyelitis virus was isolated in 1938 and 1939 in two pheasants and a pigeon. The western strain, however, was never before isolated from any subjects except man and horses. [*Cox, Herald R., Jellison, William L., and Hughes, Lyndall E. Isolation of Western Equine Encephalomyelitis Virus from a Naturally Infected Prairie Chicken. Public Health Reports, lvi (Sept. 1941), pp. 1905-1906.*]

Wood Tick Vector of Equine Encephalomyelitis Virus

That the wood tick, *Dermacentor andersoni* (Stiles) carries the virus of equine encephalomyelitis (western type) through two and probably three successive generations was shown experimentally by Syverton and Berry. The virus was passed from the female tick through the eggs to the larvae, and the larvae, nymphs and adult ticks were found to be capable of infecting susceptible hosts. This tick vector of Rocky Mountain spotted fever is, therefore, to be considered in the epizoötiology of equine encephalomyelitis along with other insects already incriminated. [*Syverton, J. T., and Berry, G. P. Hereditary Transmission of the Western Type of Equine Encephalomyelitis Virus. Journal of Experimental Medicine, lxxiii (1941), pp. 507-530.*]

St. Louis Encephalitis Akin to Equine Encephalomyelitis

Having isolated antibodies of St. Louis encephalitis in the blood serum of horses, the authors investigated its analogy with sleeping sickness of horses. The natural infection in horses may be partially responsible for the summer outbreaks in both man and horses. The studies showed clearly by experimental injections (intracerebral) that horses are susceptible to the virus of that local malady. Symptoms similar to naturally contracted equine encephalomyelitis were produced and the virus was not only recovered from brain, cord and nasal washings of the experimentally infected horses, but was also capable of reproducing the disease in other horses. Horses having a high titer of antibodies for the western type of the disease were found to be susceptible to the St. Louis virus, while horses that acquired it by natural processes were apparently resistant to subsequent infection. [*Cox, H. R., and Philip, C. B. The Susceptibility of Horses to St. Louis Encephalitis Virus. Public Health Reports, lvi (July 4, 1941), pp. 1391-1392.*]

Artificial Insemination of Pigeons and Doves

The physiology of reproduction and hybridization in gallinaceous birds was simplified by Quinn and Burrow's method of obtaining semen which the author describes in detail with illustrations for pigeons and doves. The semen collected is introduced directly into the oviduct with an eye dropper. In these birds it is not necessary to extrude the oviduct, as is done in turkeys, hens and guineas. By probing to the left side of the cloaca the oviduct opening can be found with the pipette of the dropper, which is pushed an inch or so into the duct and the semen deposited. The amount of semen required is somewhat less than that for gallinaceous birds. Pigeons and doves do not lay well unless isolated males of the species are placed in adjacent cages where the female can touch them through bars. Directions for incubation and brooding with foster parents are given. [*Owen, Ray D. Department of Genetics, University of Wisconsin. Poultry Science, xx (Sept. 1941), pp. 428-431.*]

Cows' Urine as Fertilizer for Pastures

Every ton of cows' feces contains from 12 to 16 lb. of nitrogen and 10 to 12 lb. of potassium. Although farmers are aware of its fertilizing property, cows' urine is not well conserved and used in crop production. The author cites European and American articles reporting the great increase in grass crops where this fertilizer is employed.

In his experiment the author used from 1,250

to 5,000 lb. of cows' urine per acre on four plots and set apart a fifth plot as the check. The plots were treated in April, May and June of 1939 and in May and June of 1940. Harvesting was done monthly from May to September, and the amount of dry matter and the protein it contained were recorded. The figures are given in tables for each of the five plots. They show that the yields in dry material and protein were considerably increased. On the whole, the increments for both were striking and the palatability was unimpaired even when urine containing 1 per cent of nitrogen and 1 or more per cent of potassium was applied. The effect lasted through the pasture season and into the following year. [*Nevens, W. B. Cows' Urine as a Fertilizer for Bluegrass Pastures. Journal of Dairy Science, xxiv (Sept. 1941), pp. 761-770.*]

Primary Encephalitides

Primary encephalitis of virus etiology in the human being, not of traumatic, tumoral, bacterial or parasitic origin, affects primarily the brain tissue with clinical signs implicating the brain cells. Mononuclear, polymorphonuclear, and neuroglial cells beneath the meninges, about the blood vessels and surrounding necrotic nerve cells are detectable postmortem lesions. Rabies, St. Louis encephalitis, equine encephalomyelitis, poliomyelitis (infantile paralysis), summer encephalitis of Japan, X disease of Australia, louping ill of sheep and choriomeningitis of mice and other animals are capable of causing encephalitis in man.

The features of the viruses of these encephalitides are classified. Rabies is caused by an animal virus, but no host other than man is known to transmit poliomyelitis. Japanese and St. Louis viruses may have animal reservoirs and may be transmitted by insects. Sheep, horses and other animals are known to possess specific antibodies in their serums and also complement-fixation bodies. Louping ill of Scotland is a sheep disease and is not known to affect man in nature. There is, however, a close relation between the viruses of louping ill, Japanese B encephalitis and X disease of Australia and a similarity in their epidemiology to St. Louis encephalitis. Equine encephalomyelitis is essentially a horse malady transmitted from some reservoir, possibly by insects. It affects man. It can be detected by neutralizing or complement-fixation bodies in the patient's serum two weeks or more after infection or by intracerebral inoculations of mice, rabbits, monkeys, guinea pigs, rats and sheep. Of the two types (eastern and western) the eastern type is the more pathogenic.

In short, nine types of viruses have been shown to have a special predilection for the central nervous system. Except for infantile paralysis virus, each of these can be isolated and identified. [*Webster, Leslie T. Classification of Primary Encephalitides of Man According to Virus Etiology. J.A.M.A. (June 28, 1941), pp. 2840-2841.*]

Phenothiazine in Horses, Cattle and Pigs

Since the use of phenothiazine (in Australia) had been largely confined to sheep, the authors carried out tests on horses, cattle and pigs. The product used was a compound containing 90 per cent of phenothiazine.

Horses

Fourteen draft horses, van horses, Thoroughbreds and a pony were used. Doses, given in the feed, ranging from 25 to 90 Gm. and gauged according to size were used. Egg counts per gram of feces were made for four to five days before treatment. The results were computed by the egg counts after treatment. The strongyle count before treatment ranged from 600 to 3,400 eggs per gram of feces and the ascarid count from 100 to 800. Two out of the 14 horses were fasted for 16 hours; 12 were not fasted.

The two fasted horses were severely stricken after eating the medicated feed. One of them, a draft horse of medium size, given 90 Gm., refused feed after 36 hours and suffered severely from colic. The other (of the same type), receiving 75 Gm., was seriously ill for ten days with colic, constipation, hyperthermia (104 to 106 F.), weakness, painful micturition and prolonged inappetence (3½ weeks).

The anthelmintic results as tabulated show that no worm eggs were found in the feces after treatment in 12 of the 14 horses. One of them, a Thoroughbred with a pre-treatment count of 3,400, showed but 110 worm eggs per gram of feces after receiving a dose of 30 Gm. Another, a van-type horse with a count of 800 eggs per gram of feces, still showed 50 eggs per gram after receiving 30 Gm. of the drug. The pony showed no worm eggs after receiving 1 Gm. daily for 30 days. Seemingly, repeated small doses are effective.

Liberal allowances of bran the day before, in the medicated feed, and for three to four days after treatment are recommended.

The dosage for horses, based on this observation, should be:

Heavy draft horses, 60 Gm.
Light to medium draft horses, 45 Gm.
Thoroughbreds and van types, 30 Gm.
Smaller horses, 15 to 30 Gm.

The author's conclusion was that phenothiazine is highly effective against strongyles and also very effective against ascarids in horses.

Cattle

In cattle comparable results were obtained from doses ranging from 0.44 to 1.1 Gm. per

pound of live weight. The drug, suspended in water, was given with a stomach tube. *Haemonchus contortus, Trichostrongylus axei, Ostertagia ostertagi* and *Bosciola radiatum* yielded to the treatment remarkably. Except in one animal having a pre-treatment egg count of 3,600 per gram of feces, all after-treatment counts were negative in eight critically studied cases. The rating was not as high for Cooperia spp. At this dosage the result against Trichuris, strongyloides and Moniezia were practically nil.

Cattle are not as tolerant to phenothiazine as sheep, the author points out on the basis of this experiment. All of the eight calves treated showed some ill effects. A calf, 5 months old, receiving 70 Gm. died. The post-treatment effects were diarrhea, constipation, posterior incoördination, bloating, lacrimation, colic and weakness. *Post mortem* the dead calf showed ulceration and edema of the abomasum.

For calves under 6 months, the dose should not exceed 30 Gm., an amount found to be effective in animals of that age.

PIGS

In pigs doses ranging from 0.2 to 2 Gm. per pound of live weight were used on 14 head. Worms passed after treatment compared with worms remaining *post mortem* were counted to compute results. Some of the pigs were fasted while others were given the drug suspended in water without fasting. Although the favorable results were marked in most cases, neither the number of test pigs used nor the number of worms they harbored was sufficient to draw accurate conclusions. However, the removal of 64, 88.2, 90.2 and 100 per cent of the Oesophagostomum spp. with doses of 0.3 Gm. per pound of live weight from four pigs, respectively, is evidence of the efficacy of phenothiazine against that parasite in pigs. The doses recommended for pigs are:

20 lb. or less, 5 Gm.
20 to 40 lb., 5 to 10 Gm.
40 to 80 lb., 10 to 20 Gm.
80 to 160 lb., 20 to 40 Gm.
Over 160 lb., 40 Gm.

[*Roberts, F. H. S. Phenothiazine as an Anthelmintic for Horses, Cattle and Pigs. Australian Veterinary Journal, xvii (Aug. 1941), pp. 130-137.*]

The Possession of Dogs

The American people enjoy privileges in regard to owning dogs that were once denied to common people in other countries. The landed nobility of Britain instigated laws that made it dangerous for the poor to express their love for dogs and the sports they (dogs) represent. Old books reveal the restrictions to dog ownership through the centuries. Ours in modern times is one of the few countries that does not penalize, by excessive taxes, those who keep a number of dogs. The preservation of game for the land owners themselves was the reason for the restrictive measures. Dogs of the poor had to be mutilated to disqualify them as hunters. The tailless sheep dog of England descends from this practice. In fact, penalties were so harsh that owning a dog, except by the nobility, was a stalemate for many centuries. [*Editorial, The Tailwagger, iii (Sept. 1941), p. 14.*]

Canine Tuberculous Septicemia

Tuberculosis in dogs is usually contracted from tuberculous human beings and it presents all the diagnostic difficulties of the disease in man. No case of the septicemic form has been reported before. Fever, anorexia, diarrhea, weakness and loss of flesh made up the chain of symptoms. The autopsy revealed enlargement of the spleen and liver, and numerous miliary nodes were found on the liver and kidneys. Acid-fast bacilli were isolated from these organs. Cultures showed exuberant growth in 15 to 20 days. Guinea pig inoculations were positive. The case was one of true tuberculous septicemia, which is an unusual condition in dogs. [*Feroni, P. Un caso di sepsi tubercolare nel cane. Tubercolosi, xxxii (1940), p. 179. Abst., American Review of Tuberculosis, xliv (Sept. 1941), p. 83.*]

Coccidioidmycosis in the Dog

In his conclusion, the author mentions that coccidioidmycosis may occur more frequently in animals than the literature indicates and that this parasitic infection should be kept in mind when the usual agent can not be found in lesions of suspected tuberculosis or blastomycosis.

Since Posada of the Argentine and Rickford of California first described this parasitic infection in the 1890s, numerous human cases have been recognized in California. Out of 578 human cases reported up to 1939, 278 were fatal. In 1918, Giltner (J. L.) of the U. S. Bureau of Animal Industry described the disease he recognized as such in cattle and sheep, and reported the incident in the *Journal of Agricultural Research*. In 1940, Farnes (O. J.) of Arizona described a well-investigated case in a dog (J.A.V.M.A., Sept. 1940).

The causative organism is *Coccidioides immitis*, a fungus, as shown by Ophuls in 1900, that multiplies by endosporulation and is thus distinguished from the agent of blastomycosis. When mature the organism bursts and liberates spores which are carried by the blood and lymph to establish metastases in the lungs,

bones, glands, nerve centers *et al.* In the case at hand, the lungs took the brunt of the invasion. In the sections of lung tissue examined, no normal tissue was found. The alveolar spaces were choked with endothelial leucocytes, lymphocytes, plasma cells, etc.

The organism is spherical, from 5μ to 60μ in diameter, and usually contains 100 or more spores. At 37 C. on agar, colonies form in three to four days, at room temperature in six to eight days. [*Plummer, P. J. G., Animal Disease Research Institute, Dominion Dept. of Agriculture. Coccidioidmycosis with a Pathological Report of a Case in a Dog. Canadian Journal of Comparative Medicine and Veterinary Science, v (May 1941).*]

Disinfection of Hides

The disinfection of hides has been a top problem of the veterinary services of all countries ever since the germ theory of disease was born, and everywhere civilization labors for existence there are stringent regulations governing its supervision. The United States uses a lot of leather and imports tons of hides of animals susceptible to anthrax, foot-and-mouth disease and rinderpest. Research on effective disinfection that will make hides safe has been continuous.

All of this is told by veterinarians of the U. S. Bureau of Animal Industry (C. A. Manthei and Adolph Eichhorn) in an article that reviews the literature on the subject and describes the newer methods of control brought out through studies of sodium bifluoride and silicofluoride in the disinfection of hides which were carried out at the Animal Disease Station at Beltsville, Md. Owing to its similarity to that of foot-and-mouth disease, the New Jersey type of virus of vesicular stomatitis was used. It was obtained from artificially infected horses and cattle. Two methods of employing these chemicals in different dilutions were tried and the results recorded.

The conclusion was that the effective results shown are equally applicable to hides contaminated with the virus of foot-and-mouth disease. [*Manthei, C. A., and Eichhorn, A. The Use of Sodium Bifluoride and Sodium Silicofluoride in the Disinfection of Hides. Journal of Agricultural Research, lxii, July 1, 1941.*]

Some Facts About the Sheep Head Grub (Oestrus Ovis)

Out of 689 sheep and lambs 1 year old and under, examined at an abattoir, 50 per cent were found to be infested with the larvae of *Oestrus ovis*. Among the older animals the incidence was more than 80 per cent. The animals came from Ontario and western Canada. The examinations were made from August to May. The smallest larvae were found in September and November and the largest ones in March.

Although lambs are seldom exposed to the parasite until the beginning of May, a larva was recovered from the sinus of a lamb examined July 28, showing that the life cycle may be completed in three months. However, larvae of the first instar were found throughout the fall and winter months when the weather would have prevented recent infestation. In fact, most of the larvae found from September to March were in the first instar. Where the sinuses are not examined, many first instar larvae are overlooked. Change to indoor life in midwinter did not increase the growth of the larvae. Pupae were obtained by placing larvae in dry sand at room temperature. [*Fallis, A. M. Studies on Oestrus ovis. Canadian Journal of Research, xvii (1940), pp. 442-446; abst., The Review of Applied Entomology, xxix (May 1941), p. 79.*]

BOOK NOTICES

Handbook of Communicable Diseases

A book by this title can not escape running headlong into the domain of veterinary medicine. It's the name of the battlefield where two professions meet to fight as allies for the preservation of the human species. Neither human nor veterinary medicine can be exclusive and be of much use to the people. Moreover, in regard to control measures the general principles are akin. Epidemiology (epizoötiology for us) is but the art of checking the march of pathogenic microbes. The weapons (immunization, isolation, disinfection, vaccination) differ in details, but not in principles. Where a communicable disease is the preoccupation, half-way knowledge is not enough for either the doctor in the house or the one in the stable. The doctor unaware is the doctor of other days, for the so-called interchangeable diseases are legion, generally serious and tending to increase with multiplying populations. It would be unfortunate for mankind were medical training to go on overlooking these facts. While all of this detouring is not book reviewing, it seems in order for a treatise on communicable diseases. Witness these familiar faces: anthrax, actinomycosis, rabies, tetanus, encephalitis, tuberculosis, bacillary dysentery, food poisoning, trichinosis, brucellosis, psittacosis, to name but a few at random, which call for coöperative effort in the human and animal branches of medical science.

The first three chapters are devoted to general principles and diagnostic tests. Chapter 4 is a revealing recount of specific preventive measures by artificially induced immunity, active and passive. Active immunity may be

intentionally induced in but nine human diseases, namely, smallpox, diphtheria, tetanus, scarlet fever, whooping cough, typhoid fever, rabies, yellow fever and Rocky Mountain fever. This is comparable in number with the diseases of animals which yield to preventive vaccination. Three (rabies, tetanus and certain variolas) affect animals. The remainder of the book treats with diseases in respect to definition, cause, history, immunology, symptoms, nursing, treatment, etc., in short, concise paragraphs. A list of references is appended to each chapter.

A group of tables show the importance of laboratory diagnostics and critical studies of the sick. They reveal the actual percentage of patients referred to hospitals for given diseases who were found to be suffering from maladies hidden at the bedside perspective.

In the selection of subjects and in presenting useful reference material, concise and scientifically exact, the author has unintentionally written a valuable book for the field of veterinary science. [*Handbook of Communicable Diseases. By Franklin H. Top, A.B., M.D., M.P.H., director, Division of Communicable Diseases, Herman Kiefer Hospital and Detroit Department of Health. Major, Medical Corps, U. S. Army. Cloth. 682 pages. 73 illustrations. 10 color plates. The C. V. Mosby Company, St. Louis, 1941.*]

Was It the Feed?

While searching for cause in the presence of the sick animal or herd, the question of feed enters the mind, and assuredly, nothing is more quickly eliminated than the alimentation when other factors are not evident. As a matter of fact, ailments of livestock get much of the brunt unjustly, because in veterinary practice it is commonly customary to change the feed and await results. Meanwhile, the feed stands unintentionally blamed for all the trouble. Changing feed is a precaution or is advised on the general principle that changes of diet are often helpful. The manufacturers of commercial feeds are thus made the victims of unfair interpretation of the veterinarian's motive.

Direction to change the feed is not generally a criticism of the feed itself, yet owners of sick animals are apt to go forthwith to the feed dealer and register a protest, with the ultimate result that the doctor is charged with questioning the quality of the feed he ordered replaced.

A nationwide survey of "Was It the Feed?" covering 44 states is printed in the form of a booklet showing that livestock maladies definitely attributable to commercial feeds are rare accidents. As an example of a typical report, we quote, "I can truthfully state in no single instance in our experience has the loss of livestock or poultry been traced to adulterated or poisonous feeding stuffs." This report is from the Division of Agriculture, State of Colorado. The text of this booklet is a group of analogous articles signed by well-known feed chemists and officials occupying important positions in their respective states. It is a booklet all veterinarians can read with profit. [*Was It the Feed? By various authors. American Feed Manufacturers Association, 53 W. Jackson Blvd., Chicago. 40 pages. Paper. Free.*]

Poultry Diseases and Parasites

Among the excellent technical bulletins on poultry pathology published during these years of poultry development is "Poultry Diseases and Parasites" of the Nebraska station, an illustrated pamphlet briefing the known facts about that currently important subject. In these days of "all out" to aid the American poultrymen in fulfilling their part of the defense program, such a document by capable authors is certainly a national blessing. Practitioners aiming to serve a clientele widely misled by customs of the past and by predatory agencies will profit by reading this bulletin and obeying its teachings and at the same time help in interjecting the precepts of scientific medicine into the field of poultry production—precepts intended to overcome the high mortalities which cut deeply into the national pantry and the profits of farming.

The control of poultry diseases by hygienic, sanitary and managerial programs is set down as a first principle, hopeful that in the handling of the winged species of the barnyard that doctrine will not be overlooked to the detriment of the whole effort to reduce poultry mortality. Sporadic diseases are as nothing compared with the raging contagions and wholesale mismanagement of the rations and the methods of feeding. Veterinarians will not forget that in poultry practice they are dealing with another species of milling, gregarious animals, all exposed equally to the same common causes. Infected animals, feeding and drinking habits, soil, and modern brooder house and coop equipment rank first in poultry practice.

Avitaminoses (A, B and D), favus, tuberculosis, typhus, pullorum disease, "roup," laryngotracheitis, variola, leucosis, fowl or range paralysis, blackhead, coccidiosis, worm parasites (flukeworms, tapeworms, roundworms) and the Arthropoda (lice, mites, flies, etc.) is the group of subjects covered. Obviously, the latest knowledge on these enemies of the poultryman is the first step to take in building up poultry practice on solid ground. [*Poultry Diseases and Parasites. By L. Van Es and J. F. Olney, Agricultural Experiment Station, University of Nebraska. Bulletin 332, replacing bulletins 290 and 195. 90 pages, illustrated. Paper. April 1941. Public document.*]

THE NEWS

AVMA Activities

Nominees for Executive Board Elections in Districts II and IX

Nominating elections in Executive Board districts II and IX, in progress since August 21 and 22, respectively, closed on October 21 and 22.

On October 24, W. A. Young and F. A. Anderson of Chicago acted as tellers to count the ballots and certified the following candidates:

District II.—E. R. Cushing, New Jersey; R. A. Hendershott, New Jersey; Wm. H. Ivens, Pennsylvania; J. A. S. Millar, New Jersey; Mark Welsh, Maryland.

District IX.—J. S. Barber, Rhode Island; R. R. Birch, New York; W. A. Hagan, New York; Edwin Laitinen, Connecticut; Gerry B. Schnelle, Massachusetts; R. W. Smith, New Hampshire; C. P. Zepp, New York.

Election ballots will be mailed to the members in these districts on or about November 1.

Donham Heads Committee on Bang's Disease

President Jakeman announces the appointment of C. R. Donham of Purdue University as chairman of the special Committee on Bang's Disease, succeeding R. R. Birch of Cornell University. Dr. Birch was announced in the September issue of the Journal (p. 193) as chairman of that committee, but it was later learned that he is unable to accept the appointment.

Research Council to Meet Next Month

The Advisory Research Council, which was organized at the seventy-eighth annual meeting in August, will meet in Chicago during the week of December 1 to plan its activities and adopt rules of procedure under which research grants will be administered and allocated. President Jakeman has named E. T. Hallman of Michigan State College to serve as acting chairman of the Council.

It is expected that the group, which consists of 14 members, will have before it at the December meeting several fellowship grants that already have been obtained or promised.

Members of the Council will be advised by the acting chairman as to the exact time and place of the conference. The first week in December was designated because many of the Council members will be in Chicago at that time to attend sessions of the Official Research Workers in Animal Diseases of North America, U. S. Live Stock Sanitary Association, American Society of Animal Production and other meetings held during International Livestock Exposition week.

In addition to Acting Chairman Hallman, the members of the Council are W. E. Cotton, H. H. Dukes, M. A. Emmerson, James Farquharson, H. L. Foust, W. F. Guard, George H. Hart, R. A. Kelser, M. L. Morris, E. W. Price, Edward Records, Carl F. Schlotthauer and E. A. Watson.

Joint Committee on Foods Meets

The Joint Committee on Foods of the AVMA-AAHA met in Chicago, September 26. Business transacted at that session included the adoption of a budget, approval of a new design for the seal, revision and approval of the rules and regulations governing the testing and inspection of foods submitted for consideration, and administration of the work of the Committee.

M. L. Morris of New Brunswick, N. J., was selected to serve the Committee as executive secretary and to carry on numerous details of the testing program.

Miscellaneous

President Jakeman attended the veterinary short course at Purdue University, October 15-17, and spoke on "Plans and Affairs of the AVMA," and "The Use and Misuse of Biological Products."

O. V. Brumley, chairman of the Executive Board, presented a paper on rabies at the same conference. He also addressed the twenty-second annual veterinary conference at the University of Illinois on October 14, on the subject of veterinary education.

President-Elect W. W. Dimock represented the national association at the joint meeting of the Southern Veterinary Medical Association and the Florida Veterinary Medical Association at Jacksonville, Fla., October 27-29.

Executive Secretary Hardenbergh and Editor Merillat attended the meeting of the Eastern Iowa Veterinary Association at Cedar Rapids, October 7-8. Dr. Hardenbergh also attended the Illinois and Purdue conferences, where he spoke briefly on AVMA activities, and on milk sanitation at the latter conference.

The Board of Governors will hold their win-

ter meeting at the Hotel LaSalle in Chicago, December 2.

Can You Help to Locate These Lost Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice *via* postcard or letter will be greatly appreciated.

Adrian, Jim L., 834 W. Russell Place, San Antonio, Texas.
Bernkrant, Alfred I., 414 N. Oak, Mineral Wells, Texas.
Bolin, W. L., 513 Custom House Bldg., New York, N. Y.
Bolton, Glen S., Longmont, Colo.
Bridenstine, James R., Williamsburg, Ohio.
Bridges, B. F., P. O. Box 1622, Billings, Mont.
Brillhart, Carl E., 4544 James St., Omaha, Neb.
Burns, Chas. G., Tallahassee, Fla.
Cowen, Russell L., 420 Sioux St., Winona, Minn.
Dakin, Wm. V., 517 S. Howes, Fort Collins, Colo.
Dean, W. D., Tupelo, Miss.
Dornblaser, Lt. Col. Joseph H., Fort Bliss, Texas.
Dowds, Stanley J., Floodwood, Minn.
Edwards, Ira W., P. O. Box 1776, Birmingham, Ala.
Forland, L. M., Fort Atkinson, Iowa.
Howarth, Carl R., Route 7, Box 24, Salem, Ore.
Huston, Ben S., Drew, Miss.
Irvin, W. G., N. Sycamore St., Mount Sterling, Ky.
Jones, D. L., 44 Fourth St., Fond du Lac, Wis.
Klein, Ben, R. D. No. 3, Geneva, Ohio.
Mash, Noah, 462 Dumont Ave., Brooklyn, N. Y.
Mathis, Rudy Cletus, State Veterinarian, Atlanta, Ga.
Miller, Trelford S., 146 W. 54th St., New York, N. Y.
Molt, Fred L., 117 N. E. 1st, Anadarko, Okla.
Noller, Paul Richard, Mankato, Kan.
Rodgers, Robert J., P. O. Box 61, Center, Texas.
Rosenoff, Theodore D., 642 N. Oak St., Spokane, Wash.
Shelby, Clarence F., Tallulah, La.
Simonsen, D. W., Paullina, Iowa.
Spring, Jacob E., 314 Ayres, Corpus Christi, Texas.
Starr, L. E., 356 Payne St., Auburn, Ala.
Stong, Jake, 124 Cortland St., Waterloo, Iowa.
Swarthout, Lt. Edward W., Fort Bliss, Texas.
Tanenbaum, George G., 314 S. 8th St., Estherville, Iowa.
Thompson, J. C., State Department of Agriculture, Olympia, Wash.
Venable, J. W., 702 W. Adams St., Dothan, Ala.
Werring, Lt. Milton, 715 Marshall Ave. S. W., Roanoke, Va.

APPLICATIONS

First Listing*

DOCKSTEADER, D.
Chesterville, Ont.
B.V.Sc., Ontario Veterinary College, 1940.
Vouchers: E. F. Johnston and Wm. Tennant.

DUNN, J.
Box 92, Elmvale, Ont.
B.V.Sc., Ontario Veterinary College, 1915.
Vouchers: W. Moynihan and G. A. Rose.

FOULK, CHAS. C.
1124 Harney St., Omaha, Neb.
D.V.M., St. Joseph Veterinary College, 1921.
Vouchers: Amor C. Drach and J. D. Ray.

HARRIS, FRED M.
72 - 3rd Ave., San Mateo, Calif.
D.V.M., State College of Washington, 1931.
Vouchers: W. H. Dean and Harold H. Groth.

KENELEY, FRANK
738 S. Greenleaf Ave., Whittier, Calif.
V.S., Ontario Veterinary College, 1908.
Vouchers: W. L. Curtis and John L. Tyler.

MAGUIRE, FRANK G.
12 Main St., Monson, Mass.
D.V.M., Ohio State University, 1913.
Vouchers: Stevenson Moore, Jr., and J. Dwight Pierce.

MARK, JAMES H.
Chestnut Hill Road, Litchfield, Conn.
V.M.D., University of Pennsylvania, 1938.
Vouchers: Samuel F. Scheidy and John W. Knapp.

MIDWINTER-STEANE, F.
934 Queen St., E., Sault Ste. Marie, Ont.
B.V.Sc., Ontario Veterinary College, 1928.
Vouchers: W. Moynihan and Frank Wood.

MURTY, B. C.
Parkston, S. Dak.
D.V.M., Grand Rapids Veterinary College, 1915.
Vouchers: M. H. Johnson and H. N. Waite.

OGBURN, LEONARD LOVE
1310½ Montana St., Los Angeles, Calif.
D.V.M., State College of Washington, 1938.
Vouchers: E. F. Chastain and W. L. Curtis.

PICKETT, GEORGE G.
1189 Barnum Ave., Stratford, Conn.
D.V.M., Cornell University, 1937.
Vouchers: G. E. Corwin and R. C. Olmsted.

ROY, PETER S.
Atlantic Blvd. Veterinary Hospital, 4001 Atlantic Blvd., Jacksonville, Fla.
D.V.M., Ohio State University, 1935.
Vouchers: H. C. Nichols and E. F. Thomas.

SOAVE, A. C.
5666 Telegraph Ave., Oakland, Calif.
D.V.M., State College of Washington, 1919.
Vouchers: Nelson E. Clemens and J. W. Roberts.

*See July 1941 issue, p. 74.

TIETZE, A. L. JR.
1437 Riverside Drive, Los Angeles, Calif.
D.V.M., Iowa State College, 1941.
Vouchers: W. L. Curtis and G. S. Glover.

TOPMILLER, A. C.
530 W. Main St., Murfreesboro, Tenn.
M.D.V., McKillip Veterinary College, 1907.
Vouchers: John H. Gillmann and M. Jacob.

TUBIS, PHILIP S.
470 McLean Blvd., Paterson, N. J.
V.M.D., University of Pennsylvania, 1934.
Vouchers: Elliot Kaplus and Robert R. Shomer.

TURVER, JOHN
1201 E. 12th St., Oakland, Calif.
D.V.M., San Francisco Veterinary College, 1913.
Vouchers: Nelson E. Clemens and B. F. Murray.

WILLMORE, J. H.
Rt. 1, Box 826, Mill Valley, Calif.
D.V.M., Texas A & M College, 1941.
Vouchers: Robert Boyd and Floyd H. White.

Second Listing

Barry, George H., 2528 Clement Ave., Alameda, Calif.
Bassham, Hugh A., Quitman, Ga.
Burdo, Ben S., 113 N. Main St., Centerville, Calif.
Cooper, Bert J., Box 4, Clarksburg, Ind.
Cooper, Harold K., Box 281, Roanoke, Va.
Crandfield, John G., 718 El Camino Real, San Carlos, Calif.
Latta, W. R., Orangeburg, S. Car.
Masten, C. A., Coatesville, Ind.
Mohr, E. S., P. O. Box 1311, Jackson, Miss.
Phillips, C. R., 540 Washington Pl., East St. Louis, Ill.
Reisman, Jerome H., Hillside Ave., Peekskill, N. Y.
Rosenberg, Sydney, 55 Elizabeth Ave., Newark, N. J.
Schryver, Eugene M., c/o Research and Antitoxin Laboratory, Otisville, N. Y.
Willis, James Wm., 232½ W. Glenn, Auburn, Ala.

U. S. GOVERNMENT

Army Veterinary Service

Regular Army.—The following Veterinary Corps officers are relieved from assignment and duty in the Philippine department and assigned to stations as indicated:

Major Verne C. Hill, Headquarters Eastern Remount Area, Front Royal, Va.

Captain Curtis W. Betzold, Langley Field, Va.

Captain Russell McNellis, Headquarters, South Central Remount Area, San Angelo, Texas.

Lt. Colonel Seth C. Dildine is relieved from assignment and duty at the Chicago quartermaster depot, Chicago, Ill., and assigned to the field headquarters, perishable subsistence branch, Office of the Quartermaster General, Chicago, Ill.

Lt. Colonel Louis L. Shook is relieved from assignment and duty at Edgewood Arsenal, Md., and assigned to the Chicago quartermaster depot, Chicago, Ill.

The following officers of the Veterinary Corps, now on duty at the stations indicated, have been ordered to report to the commanding officer, Chicago quartermaster depot, for temporary duty for a period of 30 days for the purpose of pursuing a special course of instruction, commencing on October 22, 1941, in the inspection of meat, meat-food and dairy products, under the depot veterinarian. Upon completion of this duty each of the officers (lieutenant colonels unless otherwise indicated) will return to his proper station:

Henry E. Hess, Fort Devens, Mass.
Stanley C. Smock, Fort Dix, N. J.
Louis G. Weisman, Fort George G. Meade, Md.
Harry J. Juzek, Camp Livingston, La.
Clifford E. Pickering, Fort Benning, Ga.
Charles M. Cowherd, Fort Benjamin Harrison, Ind.
Seth C. Dildine, field headquarters, perishable subsistence branch, Office of the Quartermaster General, Chicago, Ill.
Oscar C. Schwalm, Camp Joseph T. Robinson, Ark.
Colonel Gerald W. FitzGerald, San Antonio General Depot, San Antonio, Texas.
Captain David S. Hasson, Fort Ringgold, Texas.
Edward M. Curley, Los Angeles, Calif.
Herbert K. Moore, Office of the Surgeon General, Washington, D. C.

Veterinary Corps Reserve.—First Lieut. Ralph Cooper Fish, Jr., is relieved from assignment and duty at Camp Upton, N. Y., at such time as will enable him to arrive at his home, Delanco, N. J., on September 16, 1941, on which date he will revert to inactive status.

First Lieut. Charles B. Frank is relieved from assignment and duty at Fort Myer, Va., and will sail from San Francisco on or about November 1, 1941, for duty in the Philippine department.

Announcement is made of the promotion of First Lieut. Charles Calvin Harman, Jr., to the grade of captain, with date of rank from September 20, 1941.

The following Veterinary Corps Reserve officers are relieved from assignment and duty at the stations opposite their names and assigned to duty with the quartermaster marketing centers indicated:

Quartermaster Marketing Center, Baltimore,

Md.—First Lieut. George W. Snook, Fort Du Pont, Del.

Quartermaster Marketing Center, Norfolk, Va.—Captain Vaughn E. Ishee, Bowman Field, Ky.

Quartermaster Marketing Center, Philadelphia, Pa.—Captain Gerald W. Holmberg, Fort Banks, Mass.

National Guard.—Announcement is made of the temporary promotion of the following National Guard officers, now on active duty, with date of rank indicated opposite their names:

To Lieutenant Colonel.—Major Russell S. Gerard, August 30, 1941.

To Major.—Captain Charles H. Kitselman, September 4, 1941.

Civil Service Commission Announces Revised Examination for Veterinarians

The examination for junior veterinarian positions announced by the Civil Service Commission in July of this year has been canceled and superseded by a new examination which provides for two types of positions: junior veterinarian at $2,000 a year and assistant veterinarian at $2,600 a year. Appointments will be made in the Bureau of Animal Industry of the Department of Agriculture, the U. S. Public Health Service of the Federal Security Agency, and the War Department.

Assistant veterinarians perform general duties similar to those of junior veterinarians, but in addition inspect dairy and other food products in CCC camps and make milk-sanitation surveys, advising state and local health departments on milk-sanitation problems.

Applicants for both jobs must have completed the full course of study in a veterinary college, and for the position of assistant veterinarian, two years of experience is required in the inspection of food products, including milk and dairy products. Provision is made for the acceptance of applications from senior students for the junior positions.

Applications will be accepted at the Commission's Washington office until further notice. Further information and application forms may be obtained at first- or second-class post offices or from the Civil Service Commission, Washington, D. C.

McCarran Cattle-Theft Bill

On August 19, President Roosevelt signed the McCarran cattle-theft bill, S 1261, providing penalties for the transportation of stolen cattle interstate. The passage of the bill ends a long fight for federal legislation aimed at stolen cattle. Cattle thieves are now placed in much the same position before the federal laws as the automobile thief who crossed state lines with the stolen property. Five years in prison and a fine of $5,000 is the maximum penalty.

Violation of Serum Regulations Brings Federal Action

Violations of testing and control regulations under the virus-serum-toxin law by the Peerless Serum Co. of Kansas City, Kan., have resulted in suspension by the Secretary of Agriculture of the company's license for 90 days.

The suspension order is to be held in abeyance, however, for a period not to exceed three years, subject to its being put into effect by a supplemental order to be issued at any time within the three-year period, without further hearing, if the Secretary of Agriculture has reason to believe that the company is violating the regulations or law.

The conclusions of a hearing at Kansas City showed that the company, by violating regulations, had used its license to facilitate the preparation, sale and shipment in interstate commerce of worthless, contaminated, dangerous and harmful anti-hog-cholera serum.

The law prohibits the sale in interstate commerce of any biologic product intended for domestic animals that has not been prepared in a federally licensed establishment and requires also that the product must not be worthless, contaminated, dangerous or harmful.

Evidence used in the case was gathered by inspectors of the Bureau of Animal Industry, U. S. Department of Agriculture, which administers the law.

BAI Transfers

Cecil T. Adamson from St. Paul, Minn., to Winona, Minn., on meat inspection.

David E. Bartlett from Richmond, Va., to Beltsville, Md. (Zoölogical Division).

Ashley J. Clark from Fort Worth, Texas, to Phoenix, Ariz., on field inspection.

Russell L. Cowen from Winona, Minn., to Scottsbluff, Neb., on meat inspection.

William G. Duncan, from St. Louis, Mo., to Caldwell, Idaho, on meat inspection.

Ira W. Edwards from Montgomery, Ala., to Jefferson City, Mo., on tuberculosis.

Joshua F. Meyer from St. Louis, Mo., to Denver, Colo., on virus-serum control.

Irvine L. Nebeker from Nampa, Idaho, to Caldwell, Idaho, in charge of meat inspection.

Spencer K. Nelson from Philadelphia, Pa., to Cortland, N. Y., in charge of meat inspection.

Glen F. Patton from East St. Louis, Ill., to St. Joseph, Mo., on virus-serum control.

Donald B. Radloff from Storm Lake, Iowa, to South St. Paul, Minn., on meat inspection.

G. Roger Spencer from Denver, Colo., to Madison, Wis., on animal diseases.

Oscar Sussman from San Juan, P. R., to Charleston, W. Va., on tuberculosis.

Sales of defense savings bonds reached $1,504,411,000 on September 30, the Treasury Department announces. This is at the rate of

$300,000,000 a month since the defense savings program was launched on May 1, 1941. September sales were $232,327,000.

As of September 10, 1941, the USDA announces 55 more counties accredited in the bovine brucellosis campaign. Some 25,000 calves between 4 and 8 months of age have been vaccinated.

Press reports indicate that the Army will buy $533,850 worth of horses and mules in the period October-December, 1941. The price for riding horses is $100 and for draft types $165, for sound, gentle, well-broken animals. The numbers given are 3,110 horses and 140 mules.

J. E. Shillinger of Washington, D. C., in charge of disease research for the Fish and Wildlife Service, recently returned from a professional trip to the Northwest which ended at the meeting of the Inland Empire Fur Breeders Association in Spokane, September 12. The doctor has charge of the three research stations maintained by the government.

Two new label requirements have been instituted for meats and meat products. One requires that in mixed meat products the label must list the ingredients in the order of prominence. The other prohibits wrappings on packages which give a wrong impression as to the color of the contents. The order went into effect October 1, 1941.—*From The Bureau Veterinarian.*

AMONG THE STATES

Colorado

During the latter part of July, President Roy M. Green of Colorado State College, Fort Collins, was stricken with an illness which necessitated his taking a leave of absence to at least the first of December. Vice-President I. E. Newson has been acting in his stead, and consequently, with the opening of school, a rearrangement had to be made in the Division of Veterinary Medicine. Therefore, R. F. Bourne has been appointed acting dean and Floyd Cross, head of the Department of Pathology and Bacteriology, who was to have been on leave this year to do graduate work at Cornell University, has been asked to continue his duties until the president returns.

Florida

M. W. Emmel (Iowa '19) recently was reappointed by Governor Holland to the Florida Board of Examiners in the Basic Sciences for a term of four years. Dr. Emmel has served as chairman of the Board since it was created by the state legislature two years ago.

A. L. SHEALY.

Idaho

Hog Cholera in Sales Rings.—With the increased price of hogs and the natural acceleration in trading, losses from hog cholera have been unusually heavy in Idaho.

Practically every outbreak of that disease can be traced to public sales rings. Legislation for controlling these rings has been recommended repeatedly, but no specific laws have been enacted. Under old laws, however, the state veterinarian has placed restrictions on all sales rings in one section of the state so that only slaughter hogs are now being sold. It is almost miraculous how calls for investigations have dropped off since these restrictions became effective.

There also have been a large number of cases of pneumonia in calves sold through sales rings.

A. K. KUTTLER, *Resident Sec'y.*

Illinois

Central Association.—The Central Illinois Veterinary Medical Association held a dinner session at the Mill tavern in Springfield, September 25. The diagnosis of the principal diseases of swine by H. E. Pinkerton, plant superintendent of the Fort Dodge Laboratories, was the main subject discussed.

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Grade A Milk Law.—The State Department of Health, as of July 1, 1941, is planning to administer the "grade A milk law" passed by the legislature to replace the defective law of the same type passed in 1939. Granted that this law will actually provide grade A milk for all of the people of the state, the shortage of veterinarians is apt to be noticeable.

• • •

State University Appoints Important Advisory Committee.—On the recommendation of President Willard, the Board of Trustees, University of Illinois, has formed a committee of veterinarians and stockmen to serve in an advisory capacity for the Department of Animal Pathology and Hygiene in matters pertaining to studies on animal diseases. This department maintains a diagnostic service, for farmers and veterinarians in coöperation with the state department of agriculture, carries out an extensive research program and participates in teaching.

The new advisory committee consists of three veterinarians and two outstanding stockmen. The members are Drs. J. G. Blum of Normal, C. E. Dille of Cairo and C. Vanderwauf of Chicago Heights, and Messrs. L. L.

Drake of Yorkville and John F. Harmon, Jr., of Lebanon.

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America's Greatest Sporting Event.—The National Corn Husking Contest for 1941 will be held on the farm of Theodore Schafer near Tonica, November 3. A gruelling battle will be waged among huskers from Minnesota, Nebraska, South Dakota, Iowa, Illinois, Indiana, Kansas, Ohio and Pennsylvania. It is not generally realized that this annual contest draws a larger crowd than any other sporting event, amateur or professional.

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Sheep Scabies.—Reports from an authentic source in touch with the situation reveal that sheep scabies is becoming a veritable plague on the small farms of the state. Cause: inadequate sanitary control of sales barns and the objections raised to instituting such control over the instreaming and outstreaming animals apparently and inapparently infected with various communicable diseases. Sales barns, the reporter declares, have become so great a menace to American livestock that the Midwest will have to be placed in quarantine to protect the more fortunate parts of the country.

Iowa

Franks Named State Veterinarian.—Secretary of Agriculture Mark Thornburg has named C. C. Franks (Chi. '11) of Grimes, Iowa, to fill the unexpired term of H. A. Seidell (Iowa '17) as state veterinarian of Iowa.

Dr. Seidell, who resigned from that post recently, has made no announcements of his future plans.

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Farewell Party for H. C. Smith.—H. C. Smith (Iowa '23), assistant laboratory director of the Fort Dodge Laboratories, accepted a position as director of veterinary research, Oklahoma A & M College, Stillwater, Okla., effective October 1.

Dr. Smith, who served as secretary for the North Central Iowa Veterinary Medical Association for many years, and who is one of the founders and now the president of the Interprofessional Association Society of Iowa, was tendered a farewell party at the Wahkonsa Hotel in Fort Dodge, September 24. All of the members of the Webster County Medical Society and veterinarians from the mid-corridor of Iowa were present—about 200 in all.

The Webster County Medical Society presented Dr. Smith with a handsome matched set of luggage. In response, he expressed his appreciation of the rapidly developing spirit of coöperation between the physicians and veterinarians of Iowa in solving their mutual problems.

A. H. QUIN, *Resident Sec'y.*

Veterinary Staff Dinner.—The annual dinner of the veterinary staff of Iowa State College, Ames, was held in the south ballroom of the Memorial Union building, September 30, with 79 in attendance.

The tables were arranged in a wheel of V's, the hub being covered with flowers.

Dean Charles Murray introduced the new members and Mrs. K. W. Stouder, president of the Veterinary Circle, gave a word of greeting.

Bingo was played at the tables after dinner.

The executive committee of the Veterinary Circle (Mrs. K. W. Stouder, chairman, Mrs. Charles Murray, Mrs. I. A. Merchant, Mrs. H. L. Foust, Mrs. F. E. Walsh and Miss Lois Calhoun) were in charge of this successful and colorful affair.

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Eastern Iowa Meeting.—The 1941 session of this 28-year-old society reasserted its standing among the local veterinary-medical organizations of this country by drawing a crowd of 350 to the Montrose Hotel in Cedar Rapids, October 7-8, and carrying out a lively two-day program of outstanding interest to the whole veterinary profession. Prominent speakers, timely subjects and well-managed entertainment, for which the EIVMA has become famous, added another monument to its record in achievement.

The registration showed 225 men and 125 ladies in attendance. The banquet drew more than 300. P. V. Neuzil was the toastmaster. As usual, there was a hot debate over the scientific and practical sides of swine medicine. In fact, to learn first hand what's going on in that field, one goes to the Cedar Rapids meeting.

Contributions by speakers from out of the state were:

Encephalitis in Man Caused by the Virus of Equine Encephalomyelitis, by Carl M. Ecklund, M.D., University of Minnesota.

Vitamin Deficiencies of Cattle, by C. C. Hastings, secretary of the Illinois State Veterinary Medical Association, Williamsville, Ill.

The Relation of Balanced Rations to the Health of Livestock and Poultry, by C. A. Roadstrum, biochemist of the Vitamineral Products Company, Peoria, Ill.

Equine Practice and Diseases of Cattle, by N. J. Miller, Eaton, Colo.

Blood Studies as an Aid to Diagnosis, by W. B. Rawlings, Pitman-Moore biological laboratories, Zionsville, Ind.

The Swine Lung Worm as Intermediate Host for the Swine-Influenza Virus, by R. E. Shope, Rockefeller Institute for Medical Research, Princeton, N. J.

Among the Iowa speakers were C. C. Franks, secretary of the state association;

Dean Charles Murray, Division of Veterinary Medicine, Iowa State College; C. D. Lee, associate professor of research, Iowa State College; W. L. Andrews, practitioner; T. Henry Foster, president, John Morrell & Company; E. S. Dickey, veterinarian for John Morrell & Co.; W. L. Andrews, practitioner; Benjamin Rosenfeld, practitioner; J. A. Barger, BAI inspector in charge; J. W. Giffee, BAI swine specialist; and President H. E. Tyner.

The AVMA was represented by F. M. Wilson, member of the Executive Board; A. H. Quin, resident state secretary; J. G. Hardenbergh, executive secretary; and L. A. Merillat, editor.

The following officers were elected: Jerry Wolfe of Grand Mound, president; C. L. Moles of Dike, vice-president; A. R. Menary of Cedar Rapids, treasurer; and L. Proctor of Hazelton, member of the Board of Trustees. R. E. Elson of Vinton was reëlected secretary.

Kansas

The state board of veterinary examiners reports the conviction of the Rhodes Bros., two persistent violators of the veterinary practice act during the past 15 years. The sentence pronounced by the district court at Eureka was 90 days in jail.

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In the "Science Today" column of the *Kansas Industrialist*, Dean Dykstra of the Division of Veterinary Medicine, Kansas State College, tells the story of the contributions of veterinary medicine to public health through its researches and work on hookworm disease, Texas fever, bovine tuberculosis, and in the inspection of meat and dairy products. "Federal, state and city regulations," Dean Dykstra points out, "guard against the transmission of diseases of this kind and, therefore, have reduced them to a very low minimum."

Maine

H. W. Jakeman, president of the AVMA, was voted into honorary membership of the Maine Veterinary Medical Association, for "his untiring interest and devotion to the profession, especially in New England."

S. W. STILES.

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"What 'Breed' Are You?".—This is answered in the September *Quarterly News Letter* of the state association, which defines the three kinds of veterinarians legally authorized to practice: (1) Licensed veterinarian, who is or is not a graduate, depending upon when he obtained his license and who has paid his annual license fee. (2) Approved veterinarian, a licensed graduate authorized to inspect livestock and conduct tests for interstate shipments under federal regulations governing the interstate movement of livestock. (3) Accredited veterinarian, a licensed graduate of a recognized veterinary college who has passed the accredited herd examination of the federal government and is recommended by the state and federal authorities to appraise, brand, tag and condemn animals reacting to his tests.

Missouri

George Succeeds Curry as State Veterinarian.—J. W. George (K.C.V.C. '10) of Stafford-Webster county has been named state veterinarian of Missouri, effective October 1, succeeding H. E. Curry (K.C.V.C. '08) of Jefferson City, who held that post for eight years. Dr. George resigned from the service of the U. S. Bureau of Animal Industry to accept the appointment.

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State Association.—The fiftieth annual meeting of the Missouri Veterinary Medical Association was held at Joplin, July 7-8. The attendance was 98.

It was voted to hold the next meeting at Kansas City jointly with the Kansas state association, the Kansas City association and the American Society of Veterinary Therapy. The sum of $200 was granted to the latter "to underwrite the project," the official bulletin states. The following officers were elected: H. J. Hearrington, of Lexington, president; H. W. Young of Kansas City, vice-president; J. L. Wells of Kansas City, secretary-treasurer; and C. P. Meredith of Joplin, trustee for the 2nd district.

New Jersey

Trent Society.—Members of the Trent Veterinary Society were invited by J. B. Hagenbuch to meet at the Walker-Gordon farms on September 4, where H. H. Bair discussed phases of public health work.

A. C. Wood was elected secretary to succeed C. B. Johnston, who has been called into Army duty at Fort Monmouth, N. J.

J. R. PORTEUS, *Resident Sec'y.*

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Walker-Gordon Anniversary.—The semicentennial anniversary of the Walker-Gordon Laboratories, observed at Plainsboro, October 7, was a noteworthy fete, having brought together prominent figures concerned in the operations of the nation's nutrition. Among those participating in the event were Surgeon General Thomas M. Parran of the U. S. Public Health Service; Russell M. Wilder, chairman of the Committee on Food and Nutrition of the National Research Council; O. E. Reed, chief of the U. S. Bureau of Dairying; Theodore G. Montague, president of the Borden Company; and Henry W. Jeffers, president of the Walker-Gordon Laboratories, which is one of the Borden units.

Dr. Parran urged American farmers to ex-

pand their protein production (milk, meat, cheese, eggs) and "to do so as soon as possible." The growing of less wheat, cotton and tobacco was pointed out as an immediate need in providing Britain and our own country with food required to maintain the health and strength of their people and ours and to prevent the inevitable consequence of high prices and hoarding of food. The magnitude of the farmer's task is seen in the desperate need of concentrated proteins in Great Britain, the surgeon general stated.

The fact that food is a strategic material in war was forcefully presented at this celebration by figures well informed on the intricate details of food production.

New York

New York City Association.—A regular meeting of the Veterinary Medical Association of New York City was held at the Hotel New Yorker in New York City, October 1, C. E. DeCamp presiding.

L. Corwin, the new president of the state society, reported briefly on the activities of that organization. Guest Speaker Otto Stader of Ardmore, Pa., discussed canine distemper immunization, and C. E. DeCamp reported on a case of throat infection in a dog.

J. J. MERENDA, *Secretary*.

North Carolina

"Dr. Grady of Washington."—Under date of Sept. 20, Secretary J. H. Brown of the state association sent a circular to the members warning them about the borrowing habits of an itinerant who introduces himself as "Dr. Grady of Washington." He borrowed $5 from B. M. Weston of Asheboro "until his government check came in." From the Atherton Veterinary Supply Co. comes the information that although this chap worked for a few months at the Oyster Veterinary Hospital in Chevy Chase, Md., he is not a veterinarian.

Ontario

Annual Report of the OVC.—Principal McGilvray's report to the provincial assembly for the year ending March 31, 1941, contains condensed information on the work of a modern college of veterinary medicine striving to fulfill its purpose. Staff, methods, opportunities used, graduate and undergraduate courses and short courses for fur breeders and dairymen in which the regular students participate to mutual advantage are outlined. The undergraduate course on public health sponsored by the Ontario department of health connotes the trend in the institution that gave the researches of Banting to the world and keeps in mind the interlocking character of human and animal medicine. Note the curriculum of this specialty:

Public Health Administration
Principles of Sanitation
Communicable Diseases
Food-Borne Infections
Interpretation of Laboratory Findings
Bacteriology of Enteric Infections
Human Parasitic Infections
Inspection of Water Supplies
Inspection of Sewage Disposal
Inspection of Restaurants and Bottling Plants
Industrial Hazards in the Meat-Packing Industry
Ventilation and Fumigation
Dairy Sanitation

Not a one of these subjects is foreign to the normal stride of veterinary medicine and, certainly, some of them lie strictly within the path leading to positions waiting in the field of public health.

The dairy course dodges the gateway to the field of legitimate medicine represented in the baccalaureate curriculum. Preventive medicine, management and breeding, care of the newborn, disinfection and physical examinations for soundness are taught in lieu of the stereotyped course on disease and treatment which has marred agricultural education through the years. The fur-farming course is treated in the same manner.

Pennsylvania

Illegal Practice.—The Keystone Veterinary Medical Association of Philadelphia together with the state board of veterinary medical examiners and the law-enforcement division of the state department of public instruction now have three cases before the Quarter Sessions court for the illegal practice of veterinary medicine.

Two of these cases are concerned with small animal practice and the other, veterinary dentistry. This is the second violation of the practice act for two of the defendants, both having been convicted and fined during the past year. The defendant in veterinary dentistry has been "practicing" for almost 20 years without ever having been molested.

The Pennsylvania State Veterinary Medical Association, through its Committee on Legislation, drew up a new practice act during the past season for the purpose of providing much-needed help to veterinarians of the state in eliminating illegal practice. The new act was presented and passed the senate at the meeting of the state legislature, but was held in committee by the house of representatives, and was not submitted for vote.

No outstanding complaint was voiced against the new act. During the holding of the act in committee by the house, one of the well-known members of the state association received a phone call inquiring as to how

much money the state association had available to back the passage of the act.

RAYMOND C. SNYDER.

Tennessee

Tennessee Valley Agricultural and Industrial Fair.—This outstanding event of the Southland, of which the president is Treasurer M. Jacob of the AVMA, was held at Knoxville, September 22-27. The program of entertainment and exhibits reflected the public spirit behind this regional exposition. It was an array of industrial and agricultural displays embellished with entertainment of the higher type: music, vaudeville, horse shows, fireworks, art and education, motion pictures and everything fine and modern to make up a week's attraction.

Utah

Hendricks Resigns as State Veterinarian.—W. H. Hendricks (Colo. '18), who held the post of state veterinarian of Utah for more than 16 years, resigned October 1. He is now associated with Draper Poultryman, Inc., at Draper, Utah, as associate veterinarian, a position formerly held by C. L. Jones (K.C.V.C. '12), who resigned the past summer to become manager of the Nye-Nissen & Co. plant at Murray, Utah.

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State Association.—F. R. Mencimer of Ogden was elected president of the Utah Veterinary Medical Association at the annual meeting in Logan the past summer. E. G. Cole of Provo was named vice-president and Wayne Binns of Logan, secretary. James Farquharson of Colorado State College was the principal speaker and clinician.

J. C. FLINT, *Resident Sec'y.*

Washington

"Wegner for President."—The election of E. E. Wegner of the State College of Washington as president-elect of the AVMA at the coming San Francisco meeting was indorsed at the annual session of the Northwest Veterinary Medical Association held in Vancouver in July. Similar action was taken also by the Montana association, and other states of the West and Northwest are expected to follow suit.

Wisconsin

Northeastern Wisconsin Association.—The Northeastern Wisconsin Veterinary Medical Association held a meeting at Green Bay, October 8, with about 40 in attendance.

Walter Wisnicky of the University of Wisconsin, Madison, was the guest speaker; his subject, "Breeding Problems."

E. C. Humke of Sturgeon Bay was elected president to succeed H. W. Jacobson of Denmark, and Wm. Madison of Appleton was re-elected secretary.

JAMES S. HEALY, *Resident Sec'y.*

COMING MEETINGS

Southeast Missouri Veterinary Medical Association. Kennett, Mo. November 3, 1941. F. C. Davis, secretary, Box 131, Kennett, Mo.

Connecticut Veterinary Medical Association. University of Connecticut, Storrs, Conn. November 5, 1941. Geo. E. Corwin, secretary, State Office Bldg., Hartford, Conn.

Midwest Small Animal Association. Annual Clinic. Hotel Burlington, Burlington, Iowa. November 6, 1941. Wayne H. Riser, secretary, 17th and Ingersoll, Des Moines, Iowa.

Central Missouri Veterinary Medical Association. Marshall, Mo. November 7, 1941. Geo. F. Townsend, secretary, 213 W. Main St., Sedalia, Mo.

Mississippi Valley Veterinary Medical Association. Hotel Custer, Galesburg, Ill. November 13-14, 1941. L. A. Gray, secretary, Bushnell, Ill.

United States Live Stock Sanitary Association. LaSalle Hotel, Chicago, Ill. December 3-5, 1941. Mark Welsh, secretary, College Park, Md.

Nebraska State Veterinary Medical Association. Lincoln, Neb. December 10, 1941. J. D. Sprague, secretary, David City, Neb.

South Dakota Veterinary Medical Association. Carpenter Hotel, Sioux Falls, S. Dak. December 11-12, 1941. J. T. McGilvray, secretary, 116 N. Dakota Ave., Sioux Falls, S. Dak.

Delaware Veterinary Medical Association. Wilmington, Del. December 18, 1941. C. C. Palmer, secretary, University of Delaware, Newark, Del.

American Association for the Advancement of Science. Dallas, Texas. December 29, 1941-January 3, 1942. (AVMA representative: Ward Giltner, Michigan State College, East Lansing, Mich.)

Arkansas, Mississippi and Tennessee associations (joint annual meeting). Memphis, Tenn. January 5-7, 1942. Communications should be addressed to John H. Gillmann, 769 Vance Ave., Memphis, Tenn.

Ohio State Veterinary Medical Association. Columbus, Ohio. January 7-9, 1942. R. E. Rebrassier, secretary, The Ohio State University, Columbus, Ohio.

Minnesota State Veterinary Medical Association. Minneapolis, Minn. January 8-9, 1942. H. C. H. Kernkamp, secretary, University Farm, St. Paul, Minn.

Oklahoma Veterinary Medical Association. Oklahoma City, Okla. January 12-13, 1942. F. Y. S. Moore, secretary, Box 485, McAlester, Okla.

Indiana Veterinary Medical Association. Severin Hotel, Indianapolis, Ind. January 13-15, 1942. Charles C. Dobson, secretary, New Augusta, Ind.

New Brunswick Veterinary Association. St. John, N. B. January 14, 1942. L. S. Doyle, registrar, Moncton, N. B.

South Carolina Association of Veterinarians. Columbia, S. Car. January 20, 1942. R. A. Mays, secretary, State Office Bldg., Columbia, S. Car.

Texas State Veterinary Medical Association. Fort Worth, Texas. January 20-21, 1942. M. B. Starnes, corresponding secretary, City Health Dept., Dallas, Texas.

Illinois State Veterinary Medical Association. Springfield, Ill. January 22-23, 1941. C. C. Hastings, secretary, Williamsville, Ill.

Ontario Veterinary Association. Toronto, Ont. January 27-28, 1942. Jean M. Rumney, acting secretary-registrar, 612 King St. W., Hamilton, Ont.

Iowa Veterinary Medical Association. Des Moines, Iowa. January 27-29, 1942. C. C. Franks, secretary, Grimes, Iowa.

PERSONAL NOTES

Births

To Dr. (Colo. '39) and Mrs. H. E. Viergutz of Detroit, Mich., a son, Herbert Edward, Jr., September 12, 1941.

To Dr. (Wash. '41) and Mrs. David C. McNary of Chicago, Ill., a daughter, Carol Lynn, September 5, 1941.

To Dr. (Corn. '37) and Mrs. Jack E. Baker of North Hollywood, Calif., a daughter, Amy Dee, August 31, 1941.

Activities

S. A. Fuller (Wash. '40) has accepted a position with Columbia Dairies at Columbia, S. Car.

N. S. Mayo (Chi. '89) of Highland Park, Ill., was the guest speaker at the September 8 session of the Highland Park Rotary Club.

Edward W. Frahm (K.S.C. '35) has resigned from the service of the U. S. Bureau of Animal Industry to enter private practice at Saline, Mich.

J. R. Saunders, Jr. (Tex. '41) has accepted a position as assistant in the Department of Surgery and Clinics, Colorado State College, Fort Collins, Colo.

B. I. Copple (Wash. '31) of Boise, Idaho, won the "best liar" title of the Boise Lions Club when he told of finding a 10-lb. carp in the stomach of a bovine patient.

K. W. Stouder (Iowa '05), extension veterinarian of Iowa State College, Ames, Iowa, addressed the Lisbon night school, September 22, on the subject, "Livestock Loss Prevention."

Paul A. Soldner (O.S.U. '38), formerly in the service of the U. S. Bureau of Animal Industry, has accepted a position as instructor in the Department of Veterinary Surgery and clinics, The Ohio State University, Columbus, Ohio.

Kenneth W. Smith (Colo. '32) has been granted a one-year leave of absence from Colorado State College, Fort Collins, Colo., to take graduate work in the College of Veterinary Medicine, The Ohio State University, Columbus, Ohio.

DEATHS

Willard E. Corry, 31, secretary of the Arkansas Veterinary Medical Association, died at his home in Little Rock, Ark., August 10, 1941, as the result of a second-degree sunburn suffered while fishing in the Gulf of Mexico three days previously.

David Fox, 76, of Sacramento, Calif., died on October 5, 1941.

Dr. Fox was graduated from the Chicago Veterinary College in 1891. He joined the AVMA in 1908.

James C. Mitten, 45, of Puyallup, Wash., died on September 18, 1941.

Born at Tekamah, Neb., March 6, 1896, Dr. Mitten was graduated from the Terre Haute Veterinary College in 1916. He joined the national association in 1935.

John B. Wright, 74, retired BAI inspector, died in St. Joseph, Mo., September 7, 1941.

Born in Edinburgh, Scotland, Dr. Wright came to this country 51 years ago. He was graduated from the Kansas City Veterinary College in 1897.

A. F. Brown, 58, of Eau Claire, Wis., died on August 16, 1941.

Born in Chippewa county, Cadott, Wis., June 23, 1883, Dr. Brown was graduated from the Grand Rapids Veterinary College in 1907. He joined the AVMA in 1941.

Malcolm James Rattray, Sr., 54, of Vidalia, Ga., died on August 16, 1941.

Born at Gaylesville, Ala., March 16, 1887, Dr. Rattray was graduated from the Alabama Polytechnic Institute in 1912. He joined the national association in 1912.

Harry E. Wimer, 64, of Eagle, Idaho, died on September 18, 1941.

Born at Wellington, Kan., August 11, 1877, Dr. Wimer was graduated from the Kansas City Veterinary College in 1911. He joined the AVMA in 1930.

W. W. Lichty, 69, of Woodstock, Ill., died of a heart attack on July 26, 1941.

Dr. Lichty was graduated from the Chicago Veterinary College in 1904. His son, Dwight, is a veterinary student at Texas A & M College.

COMMITTEE REPORTS

Education

N. S. MAYO, Chairman

This year 513 students were graduated from the ten veterinary colleges in the United States, and 68 from the two Canadian colleges. It is gratifying to note that the number of veterinary students having academic degrees or more than the required two years of college work has increased. There were about 175 deaths of veterinarians reported in the veterinary journals during the year.

All of the deans report that the number of applicants for veterinary training has increased, but they also indicate that new fields for veterinary service are opening. The recent inquiry by the War Department of the United States in connection with the proposed deferment of veterinary students indicated that there is not an over-supply of veterinarians.

The State of California announces the establishment of a new veterinary college in connection with the University of California. Tentative plans have been made and, beginning with the August class this year, a four-year course leading to the degree of Bachelor in Agriculture, with two additional years for the degree of Doctor of Veterinary Medicine, will be inaugurated.

Starting this fall the University of Illinois offers a four-year preparatory course for students desiring a broad foundation for a course in veterinary medicine. This university does not offer a course granting a degree in veterinary medicine.

Two veterinary colleges have been visited, by request of the deans, by one or more members of this committee. The Veterinary Division of Michigan State College was visited by Dr. McGilvray and the School of Veterinary Medicine of Middlesex University was visited by Dr. Hagan and Dr. Hallman. They were accompanied by Dr. G. W. Famous, inspector in charge for the U. S. Bureau of Animal Industry.

In response to a request from one veterinary college the Committee has prepared the following:

Essentials of an Acceptable Veterinary School

I. Organization.—An acceptable school of veterinary medicine should be either:

a) Governmentally owned and supported and operated by a board of citizens which has and exercises the right to appoint the officers and faculty of the school.

b) If not governmentally owned, it should be incorporated as a non-profit institution; its board of trustees should be composed of public spirited citizens having no financial interest in the operation of the institution; its trustees should serve for fairly long and overlapping terms; this board should have full power to appoint officers and faculty of the institution and to determine salaries; and, if the choice of trustees is vested in any body other than the board itself, a clear statement of the mode of selection should be made.

II. Faculty.—The school should have a competent teaching staff, graded and organized by departments. Appointments should be based upon thorough training, successful teaching experience, ability in research and willingness to pursue an academic career. Nominations for faculty positions should originate in the faculty, usually being made by the dean in consultation with department heads. There should be reasonable security of tenure in order that the faculty may have adequate stability. In the preclinical sciences the faculty should consist of at least six persons of training and experience sufficient to warrant professorial rank (professors, associate professors and assistant professors) devoting their entire time to teaching and research, without which they can not keep up with the rapid progress of medical science. For each 50 students in a class, there should be at least one full-time assistant for each of the preclinical professors. Staff members whose primary connections are with units other than those of veterinary medicine and who devote the greater part of their time to the other units should not be counted or, if counted, it should be on a fractional basis according to the manner in which their time is prorated. The clinical staff should consist of not less than two full-time faculty members of professorial rank, and each of these should be provided with not less than one assistant for each 50 students in a class. Salaries should be sufficient to enable members of the faculty to support themselves and their families without the necessity of devoting time and energy to other occupations.

III. Physical Plant.—The school should

enjoy the use of modern buildings sufficient in size to provide lecture rooms, class laboratories, small laboratories for members of the teaching staff and advanced students, administrative offices and a medical library. Equipment should be adequate both for teaching and for research. A trained librarian should be employed to supervise the operation and development of the library and to keep it open and available for student use for not less than six hours per day for not less than five days per week. The library should receive the leading veterinary journals, at least a few of the medical journals and the more important journals dealing especially with anatomy, physiology, bacteriology, parasitology and pathology. The current numbers of these publications should be on racks or tables easily accessible to students, and the completed volumes should be bound and kept equally available to students.

There should be a medical museum, located in one of the buildings used for teaching veterinary medicine. The museum should have specimens of anatomic, embryologic, parasitologic and pathologic materials carefully prepared, labeled and indexed so that they can easily be found and used for teaching purposes. With each pathologic specimen coming from a postmortem examination there should be kept a record of the autopsy findings, a brief clinical history of the patient and microscopic slides showing the structure of the lesions exhibited in the gross specimens. The museum furnishes an excellent means of correlating the work of the department of pathology with the clinical departments.

For experimental laboratory work, as well as for diagnosis, a supply of experimental animals is necessary. Proper provision for the housing and care of these animals is necessary. (In work on such animals every precaution should be taken to prevent suffering, and student work must be supervised carefully.)

In addition, the school should maintain an ambulatory clinic in charge of a clinical professor in which students are given regular opportunities to obtain experience in the treatment of patients under farm conditions.

Each school should have such auxiliary teaching apparatus as stereopticons, microprojectors, manikins, models and charts.

IV. Clinical Facilities.—The hospital of the school should have facilities for examining and treating, medicinally and surgically, both large and small animals.

In the section of the hospital devoted to small animals, there should be an examining room equipped with adequate instruments for making physical examinations. The equipment should include a fluoroscope and an x-ray machine. The operating room should be provided with good illumination, a good supply of surgical instruments, sterilizing equipment and operating tables. The floor and walls should be of smooth, water-proof materials permitting frequent and thorough cleaning. There should be enough kennels, built of impervious materials and kept scrupulously clean, to accommodate all patients. A quarantine and isolation ward should be provided for contagious disease cases.

The large animal hospital should have an operating and examining room, well lighted, heated and equipped with well-built stocks and a large animal operating table. An adequate supply of surgical instruments, sterilizers, slings, casting harnesses and other equipment needed for handling large animals should be available. There should be a sufficient number of stalls, including box stalls in which patients can lie down, to provide for all patients. These should be in a building where heating equipment is at hand to keep the temperature at all times up to 60 F.

The clinical accessions shall not be fewer than 1,000 per year. These shall consist of (a) horses and mules, (b) cattle, (c) swine, (d) sheep and goats, (e) dogs and cats, (f) fowls and (g) fur-bearing and wild animals, and not more than 300 shall be counted in any one of these categories in making up the required total. Proper facilities for autopsy examinations shall be provided and these shall consist of not less than 200 individuals, of which not more than 50 in any of the categories of the preceding paragraph shall be counted. The autopsies should be performed by a member or members of the staff of the department of pathology assisted by senior students, and the material secured should be used in connection with the clinical-pathologic conferences.

V. Resources.—Experience has shown that modern medicine can not be acceptably taught by schools which depend solely on the income from students' fees. No veterinary school, therefore, should expect to secure approval if it does not have a substantial income in addition to students' fees.

VI. Administration.—There should be careful and intelligent supervision of the entire school by the dean or other executive officer who, by training and experience, is fitted to interpret the prevailing standards in veterinary education, and who is clothed with sufficient authority to carry them into effect.

There should be a satisfactory system of records showing clearly and in detail the admission credentials, attendance and grades of each student by means of which an exact knowledge of his work may be obtained. Except for good cause, such as illness, no credit should be given for any course when the attendance has been less than 80 per cent of the full time.

VII. Admission of Students.—The admission of students should be in the hands of an exam-

iner or a responsible committee whose records shall always be open for inspection. Documentary evidence of the student's preliminary education should be kept on file. The number of students to whom an adequate veterinary education may be given is related directly to the laboratory and hospital facilities, the size and qualifications of the staff, and the amount of clinical material available. A close personal touch between students and teachers results in an efficiency which is not possible in an institution where the number of students is excessive. Unless the facilities, staff and number of annual clinical accessions is far greater than the minimum specified above, the school should not have more than 50 students per class.

At the present time, only those schools which conform to one or the other of the following requirements will be approved:

a) Those which require for admission a minimum of one full year of college work in an institution accredited by the state university or the state education department of the state in which it is located.

b) Those which institute a curriculum of not less than five full years, based upon 15 high-school units, and of which not less than 30 semester-credit units shall consist of subjects of nonprofessional nature offered by members of faculties other than veterinary medicine.

The school should issue, at least annually, an announcement or a bulletin describing the kind of work offered, giving the names and qualifications of the teachers; the curriculum with each course identified by number, name, description of content, character (recitation, lecture, laboratory or clinic), length of time, when, where and by whom given, and the amount of credit allowed. Information should be given regarding entrance requirements and tuition fees. The names and home addresses of the students enrolled in the current or immediately previous session should be included.

VIII. Curriculum.—The entire course of four years shall consist of not less than 3,600 hours and not more than 4,200 hours, distributed fairly equally among each of the years. The subject groups as set forth in the following schedule shall be allotted approximately the percentage of the total time indicated:

	Per Cent
Anatomy, including histology and embryology	20.0
Physiology and biochemistry	7.5
Pathology, bacteriology and immunology	15.0
Parasitology	2.5
Materia medica and pharmacology	4.5
Surgery (exclusive of clinics)	6.00
Obstetrics (exclusive of clinics)	2.0
Medicine (exclusive of clinics)	8.0
Clinics (combined)	20.0
Miscellaneous and electives	14.5

State Practice Requirements

This committee has tried to make a survey and summary of the laws and regulations governing veterinary practice in the various states, but the laws are so varied that it has been difficult to summarize them. All states have a veterinary examining board or its equivalent. Seven states require applicants to be graduates of colleges recognized by this association and two states specify that applicants must be graduates of colleges recognized by the U. S. Bureau of Animal Industry. A number of states require the applicants to be graduates of a college "legally incorporated," "reputable," "in good standing," or "recognized college in the United States, Canada or Europe."

A majority of the states require the applicant to be acceptable to the board of veterinary examiners. The number of members of the examining boards varies from two to seven, the usual number being three or five.

Many state laws governing veterinary practice were passed years ago and in a number of states efforts are being made to bring the laws up to date.

Accredited Colleges

It is gratifying to report that increased facilities and equipment have been installed in most of the veterinary colleges. The State of Washington has made appropriations for a much-needed new building for the state veterinary college.

The Committee recommends that the following colleges be placed on the accredited list and that their graduates be eligible for membership in this association:

1) Alabama Polytechnic Institute, Division of Veterinary Medicine.

2) Colorado State College, Division of Veterinary Medicine.

3) Université de Montréal, École de Médecine Vétérinaire de la Province de Québec.

4) Iowa State College, Division of Veterinary Medicine.

5) Kansas State College, Division of Veterinary Medicine.

6) Michigan State College, Division of Veterinary Medicine.

7) Cornell University, New York State Veterinary College.

8) The Ohio State University, College of Veterinary Medicine.

9) University of Toronto, Ontario Veterinary College.

10) University of Pennsylvania, School of Veterinary Medicine.

11) Texas A & M College, School of Veterinary Medicine.

12) State College of Washington, College of Veterinary Medicine.

In view of the progress being made, the

Committee recommends that no classification of veterinary colleges be made this year.

Respectfully submitted,

(signed) N. S. MAYO, *Chairman.*
W. A. HAGAN,
E. T. HALLMAN,
L. M. HURT,
C. D. MCGILVRAY.

Rabies

R. A. KELSER, Chairman

The report of your special Committee on Rabies for this year will be brief. This is not because a rabies problem has ceased to exist in the United States, thereby eliminating the necessity for a rabies committee, but because of a move aimed at coördinating the efforts of several organizations interested in the control of rabies. As many of you may know, there are two associations other than the American Veterinary Medical Association which have committees on rabies. These are the United States Live Stock Sanitary Association and the American Animal Hospital Association. As the three committes have a common purpose, it will be immediately apparent that there should be a means for coördinating their efforts.

During the 1940 meeting of the United States Live Stock Sanitary Association, held in Chicago, the rabies committee of the American Animal Hospital Association presented a report before the assembly of chief livestock sanitary officials. This report contained, among other things, a recommendation for the organization of a rabies committee consisting of two representatives from each of the following organizations: United States Live Stock Sanitary Association, American Veterinary Medical Association, American Animal Hospital Association, American Medical Association, American Kennel Club, American Humane Association and United States Department of Agriculture. The president of the American Veterinary Medical Association accepted the invitation to name two members to this proposed committee. One representative is the present chairman of the rabies committee of the AVMA and the other, William A. Hagan, a member of our committee.

In view of the formation of the committee representing the various organizations indicated above, your special Committee on Rabies is not, this year, presenting a discussion of the rabies subject nor making recommendations with regard to the disease. It does recommend, however, that this association approve the move to coördinate the work of the rabies committees of the United States Live Stock Sanitary Association, American Animal Hospital Association and American Veterinary Medical Association, through participation with these and the other groups represented by the new committee, organized as suggested by the rabies committee of the American Animal Hospital Association.

Continuance of the special Committee on Rabies of this association is recommended.

Respectfully submitted,

(signed) R. A. KELSER, *Chairman.*
M. F. BARNES,
C. E. COTTON,
JOHN H. GILLMANN,
W. A. HAGAN,
J. V. LACROIX,
H. W. SCHOENING.

Biological Products

HADLEIGH MARSH, Chairman

The Committee on Veterinary Biological Products met on December 4, 1940, at Chicago. Except for that meeting, it was necessary to carry on the work by correspondence.

The Committee recommends that the following fifteen biological products be added to the list of those acceptable to the American Veterinary Medical Association:

Anaerobic antitoxin
Anti-bronchisepticus bacillus serum
Anti-canine-distemper serum (antiviral)
Anti-encephalomyelitis serum (eastern)
Anti-encephalomyelitis serum (western)
Anti-encephalomyelitis serum (eastern and western)
Anti-feline distemper serum
Anti-streptococcus serum
Gonadin serum
Staphylococcus aureus toxoid
Canine-distemper virus (tissue origin)
Fowl-pox vaccine
Pigeon-pox vaccine
Clostridium chauvei-septicum bacterin
Hemolyticus-bacillus bacterin

This brings the number of products classified as acceptable since the Committee was established to 39. This acceptance applies only to products manufactured under U. S. veterinary license and inspection of the Division of Virus-Serum Control of the U. S. Bureau of Animal Industry.

The members of the Committee have agreed that the values of the products included in the acceptable list have been well established. There may be other products prepared under U. S. veterinary license which merit approval, but, in the opinion of the Committee, the evidence available at present does not justify our including others.

In the report of the Committee for 1940, an unfavorable opinion was expressed in regard to the group of nonspecific products, which includes the mixed bacterins and the mixed anti-

bacterial serums. The Committee again feels that it can not recommend this group of products for acceptance, on the ground that they are nonspecific.

The problem of shipping biological products interstate to stockmen in violation of state regulations, in states where there are restrictions on the use of certain biological products, has been brought to the attention of this committee by two state associations. This question is under consideration by the association of livestock sanitarians, but, in the opinion of the Committee, this problem should also be considered by the AVMA.

The Committee has given this subject considerable study, and takes the following position on the problem. The solicitor of the U. S. Department of Agriculture has ruled that, under the present law, the U. S. Bureau of Animal Industry is without authority to prohibit interstate movement of biological products prepared in licensed establishments and in compliance with Bureau regulations, even though the state of destination has regulations prohibiting the distribution of the licensed products which originated in another state. The Committee does not consider that it is advisable, at the present time, to recommend changes in the Virus-Serum-Toxin Law to cover this situation. While it seems to us that there should have been some federal restriction on the distribution of products consisting of live viruses or live organisms, the problem of enforcing state regulations appears to be one that must be solved by the states promulgating these regulations. The U. S. Bureau of Animal Industry has recently issued an order, effective January 1, 1942, amending BAI order 276, to the effect that no person shall ship interstate any product consisting of live virus or live organisms without sending a notice in a prescribed form to the BAI and to the livestock sanitary official in the state to which the shipment is consigned. The enforcement of this order should be of great assistance to state officials in controlling the situation.

A strict interpretation of the duties of this committee as stated in the by-laws would confine its activities to reporting on the value of biological products. The Committee feels, however, that it should properly consider other problems in connection with biological products which may be presented.

Respectfully submitted,

(signed) HADLEIGH MARSH, *Chairman.*
J. G. HARDENBERGH, *Sec'y.*
FRANK BREED,
C. C. DOBSON,
F. A. IMLER,
HARRIE W. PEIRCE.

History

L. A. MERILLAT, Chairman

The Committee on History is not famous for achievement in the rôle indicated by its name. It was stated in previous reports that little was ever accomplished in gathering data to whip into the form of historic material on the veterinary services of the United States and Canada. Notwithstanding that certain recommendations were made from time to time and printed in the records, the Committee's work was never outlined. No one, not even the Committee itself, has been enthusiastic over the writing of an American veterinary history or placing on record a certain amount of material that could be used by some future American historian.

In our country, as in all others, the time is sure to arrive when the demand for such a book will be more apparent. We have always had so much unfinished business to do that the writing of history was not even thought of as a part of a profession's duty. We have yet to heed the often repeated warning that planning well for the present and future is best accomplished by weighing the events of the past. The man or group planning without the past as the guide, works as if blind and does not avoid the pitfalls, the faults and the mistakes only authentic history can point out. It is notorious in our field that the faults of the forefathers can be and too often have been committed by each generation because they (the faults) were not of record as warnings.

Because nothing much was ever done to make him so, the American veterinarian is not history-minded. The fault is ours, not his. Until we can place in the veterinarian's hands a clear tableau of the road his profession has traveled and of the place he now occupies in the national scheme, the reports of this committee will go on seeming vague and unimportant. One of the Association's duties is to teach its personnel the importance of historic guidance. We can not thrive and prosper on the mere instinct governing the fate of gregarious animals.

We can not too highly praise the great veterinary history of the world written by our good friend and colleague, Leclainche, who wrote the first book of its kind at the ripe age of 80 as a gift to future generations. Leclainche's history of 900 pages outlines the veterinary services of all countries. It was obviously presumed that it would be translated into all of the modern languages. But, inasmuch as the world has gone crazy, that desire has to be postponed for the coming of post-war sanity. This the Committee mentions to keep alive the thought of subsidizing that work for English language readers at some convenient future time. Such a book with the American

section aggrandized would be a precious piece of literature for this Association to furnish.

In this report we have a definite proposal to make to the House of Representatives: President Wight appointed a true historian to our Committee. He is Bert W. Bierer of Towson, Md., who has written seven monographs on American veterinary history which this committee should be instructed to review with the object of adopting them as official documents of the Association. This done, the Committee recommends that it be instructed to proceed systematically in gathering biographies of all prominent veterinarians of the United States and Canada, deceased and living, and file them in the archives as basic material for a book of the future, entitled "American Veterinary History." In just a few years the Committee on History should have gathered enough material to justify the publication of a real blue book that would, no doubt, be self-contained.

This plan will require a small annual appropriation for clerical work and postage which we recommend for inclusion in the annual budget. Needless to conclude, this is the first proposal to outline a stated plan for this old but inactive committee.

Respectfully submitted,
(signed) L. A. MERILLAT, *Chairman.*
BERT W. BIERER,
GEORGE H. GLOVER,
LEONARD W. GOSS,
C. M. HARING,
R. S. MACKELLAR.

Interstate Shipment of Livestock by Truck

J. L. AXBY, Chairman

Careful investigation of the interstate shipment of livestock by truck leads your committee to state that the problem is difficult and comprises many angles.

It is the unanimous opinion of the Committee that all persons, firms or corporations engaged in interstate shipment of livestock by truck should be licensed by some agency of the federal government.

They should be required to comply with the same requirements relative to unloading for rest, feed and water that now apply to other transportation companies under supervision and control.

All thus engaged also should be required to have all livestock so shipped, accompanied with a bill of lading, to definitely establish the destination of the livestock, to avoid its being diverted into channels other than originally claimed.

Health certificates should accompany all shipments made in conformity with the requirements of the federal government, and the state of destination.

We recommend that the license of any person, firm or corporation should be revoked when found in violation of the procedure above recommended.

All trucks so engaged should be cleaned and disinfected prior to the loading of livestock and subsequent to the unloading of livestock.

We recommend that the only exceptions to the above requirements be those shipments not accompanied with an official health certificate may be accompanied by a permit from the chief sanitary officer of the state of destination, in which case the animal so shipped shall be subject to test, quarantine or vaccination at destination, in conformity with the requirements of the state of destination.

Respectfully submitted,
(signed) J. L. AXBY, *Chairman.*
H. E. CURRY,
V. S. LARSON,
H. C. RINEHART,
H. A. SEIDELL.

Veterinary Participation in National Defense

WM. MOORE, Chairman

The chairman went to Washington on June 5, 1941, and again on July 28 to confer with President Wight, Dr. Mohler, Col. Kelser, Dr. Fladness and others on matters pertaining to the Committee's work. After thoroughly discussing the situation we decided that it should be made generally known that the veterinary profession wishes to coöperate in every way possible in national defense and that all veterinarians will be on the alert to detect any evidence of contagious diseases not now present in this country, the spread of which would be a serious menace to the nation's livestock industry.

At the first conference referred to above, it was decided to change the name of this group from the Committee on National Defense to the Committee on Veterinary Participation in National Defense.

We feel that this is an important committee and that it should be continued.

Respectfully submitted,
(signed) WM. MOORE, *Chairman.*
E. A. CAHILL,
S. O. FLADNESS,
L. M. HURT,
R. S. MACKELLAR,
L. A. MERILLAT,
A. F. SCHALK,
C. H. SEAGRAVES,
R. F. VERMILYA.

Parasitology*

D. W. BAKER, Chairman

In its first report, presented at the seventy-seventh annual meeting in 1940, the special Committee on Parasitology recommended that a survey be made of the occurrence and importance of the parasites of the various species of domestic and wild animals in different parts of the United States and Canada. This is an ambitious program which will require a considerable amount of time and a great deal of collaboration on the part of many persons located strategically with reference to the areas to be surveyed. A modest beginning, however, has been made.

Dr. Stevenson, member of the Committee from Canada, reports that injury caused by the six most troublesome parasites of sheep—namely, stomach worms, hookworms, nodular worms, small intestinal worms, tapeworms and sheep keds—is the greatest single item holding back sheep husbandry on Canadian farms. During the past twelve months, a relatively small number of flock owners have given more attention to nodular worm control and have used a phenothiazine compound in combating this parasite. The copper sulfate-nicotine sulfate drench, however, remains the most popular general worm drench in use.

In Texas, according to Dr. Van Volkenberg, Dr. Boughton, who is located at Sonora in the heart of the range country, reports that the common stomach worm, *Haemonchus contortus*, is the most serious parasite of sheep in west Texas. Phenothiazine, with either bentonite or molasses as a wetting agent, is being used extensively in the form of a drench for the treatment of sheep infected with stomach worms. It is conservatively estimated that between 2 and 2½ million sheep and goats have been treated since May. The results have been excellent, no cases of phenothiazine poisoning or photosensitization having been seen in either sheep or goats. In many serious outbreaks of stomach-worm infection phenothiazine has proved to be the only remedy that will stop death losses.

Due to climate and topography parasitic diseases are more common and serious in the area along the Gulf coast of Texas than in the range country. In addition to the common stomach worm several other species of roundworms, including the small trichostrongyles, are common and serious. Since several treatments are necessary to control the parasites, the use of phenothiazine is generally considered by sheep owners in this area to be too expensive.

Dr. Emmel of the Florida Agricultural Experiment Station reports that an estimated 50 per cent of beef-cattle diseases in the South are parasitic in nature, and that if only young animals were to be taken into consideration, this percentage would be greatly increased. In young dairy cattle, parasites are particularly important. In Florida increased cattle populations per given area, brought about by improved pastures, have resulted in a parasite problem which threatens the whole structure of the rapidly increasing beef-cattle industry of that state. Education and research in the field problems involved will probably offer some solution to the problem eventually. Coccidiosis and lung worms are the most important parasites in young animals, while stomach worms, small intestinal worms, nodular worms and hookworms predominate in older cattle.

The sheep population in the deep South is not large, but parasitic diseases are the outstanding disease problem, stomach worms and nodular worms being the most important parasites.

Common roundworms, stomach worms and lung worms, and in some sections kidney worms, are prevalent in swine, and roundworms and other parasites are one of the principal disease problems in horses.

Dogs and cats are heavily infected with parasites, and parasitism is directly or indirectly responsible for 85 per cent of the poultry-disease problems in the South.

Dr. Emmel expresses the opinion that in Florida and adjacent territory the parasites and parasitic diseases of all classes of domesticated animals are of greater economic importance than any other disease factor and that together with faulty nutrition due either to poor management or deficiencies in the feeds, they present a perplexing economic problem.

Although this report deals principally with parasites of some domestic animals in two southern states, it should be emphasized that parasites and the disease problems for which they are responsible are by no means confined to the South. Dr. Stevenson's observations concerning parasites of sheep in Canada and recent papers by Baker, Shaw, Rebrassier and others reporting parasitic infections in sheep and cattle from such widely separated areas as New York, Ohio and Oregon indicate that parasitism in domestic animals is widespread and deserving of serious attention on the part of veterinarians and livestock producers.

Respectfully submitted,

(signed) GERARD DIKMANS.
D. W. BAKER, *Chairman*.
E. A. BENBROOK,
M. W. EMMEL,
C. R. SCHROEDER,
L. STEVENSON,
H. L. VAN VOLKENBERG.

*This report was prepared by Gerard Dikmans.

Public Relations

MARK WELSH, Chairman

In the past 20 years the veterinary profession has made more desirable progress than in all of its history. As the value of domestic animals has increased, the need for veterinary services has become more apparent.

The requirements for admission to our colleges are higher, and the curriculum has been lengthened and strengthened so that today the educational background of the veterinarian compares favorably with that of any other professional man. Our work is being recognized more and more for its interrelation with the economies of livestock production and with the protection of the health of our people. We have long known that certain diseases of animals may be directly or indirectly transmitted to man, and each year new evidence is presented showing the relation between diseases of different species of animals and of human beings. The leaders in the medical science fields fully realize the value of contributions made by veterinarians, but the public at large is still ill-informed as to the work and accomplishments of our profession. It is the responsibility of the Committee on Public Relations to inform and educate the public through every legitimate channel open to us.

During the past year, as in previous years, numerous articles have been carried by papers having local and national circulation reporting the various phases of veterinary work. National magazines, such as *Life*, *Time* and *News Week*, have favorably commented upon our profession and the accomplishments of individual members. The present trend in motion pictures and radio is to show the veterinarian as a useful and important individual in the general activities of his community and especially in those matters dealing with animal diseases. This changing attitude of the public toward the veterinarian and his work may in part be due to the activities of this committee and coöperative groups, but the major credit primarily goes to the individual practitioner and the public official, who through their work and personal contacts have done more to merit public acceptance and approval than would be possible for any group of committees to do for them.

In previous reports of this committee it has been indicated that there is a decided need to coördinate the public relations work of the state associations with that of the national association. In some states public relations committees have been appointed for publicizing veterinary work. In others the secretary of the association has carried out this function but, unfortunately, in many states this necessary work has not been the definite responsibility of any individual and little, if any, attention has been given to it. It would seem desirable, therefore, that there be a closer relationship established between a specified individual in each state association and the national committee responsible for public relations work. Primarily this would involve sending items of general interest to newspapers and periodicals. From information available, it would appear that about 70 per cent of the news of veterinary activities would be of local interest only, and the remainder would be of more or less national interest. Such matters considered to be of national interest would be referred to the chairman of the AVMA public relations committee for his consideration, and those found desirable would be forwarded to the national association's publicity organization for presentation to the general public over the various wire services as special articles, over the radio and through such other means as are available. Advance information on coming meetings, including the date, time, speakers, demonstrations and, in so far as possible, those planning to attend, should be released. News stories should be written covering the main items presented by the various speakers, the names and addresses of the officers elected, reports of new treatments or operating technics and special appointments or honors received by members. The building of a new hospital as well as births, deaths, and marriages are always newsworthy, at least locally. Many of these items may be of state-wide or national interest and often a feature story of national appeal can be fashioned from an unusual happening in a local community.

It seems imperative that all public relations work be coördinated by the secretary of the AVMA. His office is in closer touch with all phases of veterinary medicine throughout the country than any other agency can possibly be. It is not the desire of this committee to further burden the secretary, but it is our suggestion that the Executive Board carefully consider the desirability of having all publicity work of the Association cleared through the central office, and that it be charged with the responsibility of promptly distributing such information and data as should be released to the public. Few veterinarians have had experience or training in establishing or maintaining desirable public relations. It is again recommended, therefore, that each state association appoint one of its best-qualified members to serve as chairman of a committee on public relations. To further the local and national

work in this respect, it is recommended that at the national meeting a definite hour be assigned for the discussion of this work by those interested and that plans for the coming year be formulated.

In the last report of this committee there was included a letter from the director of the federal extension service. In this, M. L. Wilson definitely outlined the scope of work of county agents in so far as it pertained to veterinary work and it was presented with the hope of further promoting harmonious relationships between all extension workers and the veterinary profession. Although this report was given wide publicity, it does not appear that in many sections certain objectionable practices have been curtailed. It is probable that activities that have been conducted over a period of years can not be adjusted at once, but your committee feels that with the clear-cut stand taken by the federal director, action should be taken to correct undesirable situations. It is recommended, therefore, that where county agents are engaged in activities considered at variance with the recommendations of the director, local adjustments with the individual be made if possible, and if desirable action is not obtained, the matter be taken up with the state director of the extension service through a committee of the state association. If after this action the situation is not corrected, the information should be presented to the federal director by the state association or through the national association.

Veterinary work is being conducted on an increasing scale by the states, often in coöperation with federal agencies. Of necessity, such programs infringe upon private practice. Where such programs are carried out for the eradication of specific diseases, such as tuberculosis and Bang's disease, official work should cease in a given herd or community when the objectives have been attained, and further work referred to the local practitioner. With such a marked difference in the veterinary organization of various states, it is difficult, if not impossible, to establish a unified national program. In previous reports this committee has recommended the establishment and maintenance of a state livestock disease-control service on a Civil Service or similar basis. Virtually all state veterinary officials, as well as the United States Live Stock Sanitary Association, approve and endorse this plan. It is hereby recommended that a standing committee be appointed to study and adopt a definite program for the establishment of an adequate livestock disease-control service and to initiate, through proper channels, its adoption by states not now having one. It is inconceivable that the best interests of the livestock industry and the public health can be served in states having frequent changes in the administration and personnel of their disease-control service. This committee feels that the properly conducted regulatory activities of official agencies are performing a necessary function within their sphere. There undoubtedly will be a twilight zone between their work and that of the practitioner. It is apparent, however, that in those states maintaining a well-organized and properly functioning animal-disease-control service, there is better control of communicable and infectious diseases, closer and more helpful coöperation with the practitioner and greater benefits to the livestock industry.

Your committee has previously indicated the need for the compilation and distribution of animal mortality and morbidity statistics. Vital statistics are obviously the key to all future plans and it is on the basis of such data that requests may be justified for additional appropriations for animal-disease work. It seems apparent that only the federal Bureau of Animal Industry is in a position to collect, compile and distribute such needed data. This agency does not at present have such a department; neither does it have funds or authority for establishing one. It is true that excellent data have been compiled on specific diseases, such as tuberculosis, Bang's disease and southern cattle fever, but it is equally true that no current data are available on rabies, encephalomyelitis and many others. Such data would have to be gathered and compiled by states, as some are now doing. It is impossible, however, for a state regulatory official to properly control disease within his state unless he is familiar with its occurrence and extent. It is equally impossible for him to function properly when he is not informed of the health status of domestic stock in adjoining states or in those from which he is receiving shipments. It is recommended, therefore, that a subcommittee of the Executive Board be empowered to confer with the chief of the federal Bureau of Animal Industry and that definite action be initiated toward the establishment of a division of vital statistics, similar to that serving the needs of the medical profession. The reporting of mortality and morbidity data serves as a basis for continuous publicity for the medical profession, and similar data could easily serve the same purpose for the veterinary profession as well as give a factual basis for the conduct of current work and the planning of future activities.

In previous years definite efforts were made through this committee to present to senior medical classes and other medical groups information concerning the field of veterinary medicine. Considerable difficulty was experienced in securing satisfactory speakers for the hours and dates available for this purpose. In certain medical schools these addresses have been well received and have been repeated for

the past few years. In many others, however, it has been almost impossible to make satisfactory arrangements. It is desirable, however, that medical students as well as practicing physicians be fully informed on the current status of veterinary medicine. It is again recommended that a readable article of interest to such an audience be prepared and distributed from the central office with the hope that the wider coverage may compensate for the more desirable personal contacts. As many veterinarians are requested to discuss various phases of their work before service clubs, farm groups, and other organizations, and as many decline to appear because of lack of time to prepare the material, it is suggested that the central office have available several ten- or fifteen-minute addresses for this purpose. Through such personal appearances the value of veterinary work would be recognized more fully than at present and, in the aggregate, this activity would serve as the best type of national public relations.

There is a shortage of qualified veterinarians and it appears that this shortage will become increasingly acute as our armed service is expanded and the civilian defense needs become greater. It does not seem within the province of this committee to outline the activities of the veterinary profession for national defense, but it does seem proper that all of us lend full support to whatever program may be adopted by the Association.

It is felt, also, that the shortage of qualified personnel may encourage non-graduates to engage in practice. Control of this is essentially a responsibility of the officials within the individual states, but it is considered desirable that this danger be brought to the attention of the profession for whatever local action may be deemed necessary.

During the past year the Associated Serum Producers, through their educational bureau, the American Foundation for Animal Health, have continued their splendid campaign to the public on behalf of our profession. Through newspaper releases, farm-magazine articles, radio talks, illustrated articles and farm-paper advertising, this campaign is reaching millions of livestock owners with timely information concerning disease dangers and is constantly urging owners to consult a veterinarian for reliable diagnosis and treatment of all livestock ailments. The campaign is doing much to make the public livestock disease-conscious, and to give livestock owners a higher conception of modern veterinary science and service. Its major activity is concentrated in the ten states extending from Ohio to Nebraska and from Oklahoma to Minnesota, but the association has also made its material and resources freely available to veterinary associations and groups throughout the United States, and many state associations have found this of great assistance in their own public relations work. The cost of the campaign is being defrayed entirely by members of the Associated Serum Producers. The Committee on Public Relations heartily commends this public-spirited and effective campaign on behalf of the profession, and sincerely hopes that it will be continued.

Your committee feels that over the past several years definite progress has been made in establishing the veterinary profession in a favorable light before the public. This has not been due to the activities of any one individual, but if major credit were to be assigned, the editor and secretary of our national association would be in the first rank. This committee congratulates them on their excellent work, particularly as it relates to the increasing appreciation of the general public for the various fields of veterinary medicine.

Respectfully submitted,

(signed) MARK WELSH, *Chairman.*
J. G. HARDENBERGH, *Sec'y.*
K. G. MCKAY,
C. F. SCHLOTTHAUER,
E. C. W. SCHUBEL,
CASSIUS WAY.

Proprietary Pharmaceuticals

R. L. MUNDHENK, Chairman

The activities of the 1940-41 Committee on Proprietary Pharmaceuticals began in the fall of 1940 with an interesting circular correspondence among the members and has continued throughout the year. Attention was first given to the duties of the Committee, outlined in paragraph 7 of section 1, article XII of the Administrative By-Laws, as follows:

1) To study the merits of proprietary (non-official) pharmaceutical preparations employed in the practice of veterinary medicine.

2) To coöperate with the Food and Drug Administration of the Federal Security Agency and with the Federal Trade Commission.

3) To coöperate with groups in the allied medical professions engaged in activities parallel with those of the Committee.

4) To submit a report of its work at the annual session.

By far the most important and necessary function is expressed in the first paragraph, and the Committee is equipped with neither the facilities nor the funds necessary for carrying out this study.

The second and third functions, those of coöperating with the Food and Drug Administration, with the Federal Trade Commission and with similar groups in the allied medical professions, have required no attention from the 1940-41 committee, as no call on this committee has been made by the organizations named.

The fourth function is a routine matter. Like

many other committee reports, they have in the past been prepared, presented and filed. Once filed, they remain filed.

In the 1940-41 Committee correspondence the first inquiry made of the members covered three points:

1) What are your suggestions for the Committee's work this year?

2) Has the new Food, Drug and Cosmetic Act affected the work of the Committee?

3) Do you think that the Committee is any longer necessary?

Replies were received from all members. Among other suggestions were several to the effect that the Committee should stand ready to act in an advisory capacity to lay publishers relative to advertising nostrums, and another pointing out that publication in the JOURNAL of the findings of the courts on veterinary products issued by the Food and Drug Administration and the Federal Trade Commission had been recommended previously, but apparently was not being carried out.

Throughout Committee correspondence there has been recognized the urgent need for authoritative information on many proprietary pharmaceuticals.

As it appears impossible at present for the American Veterinary Medical Association to set up and maintain laboratory facilities of its own, tentative inquiries were instituted with a view of determining the practicability of coöperation with the pharmacologic departments of various veterinary educational institutions in an attempt to secure information concerning the toxicity, action, etc. of certain of the newer drugs.

Brief extracts from replies to this inquiry are as follows:

1) R. S. Amadon, Pennsylvania: "Suggestions are along the lines my thoughts have taken from the time the Committee was established. With proper financial support, I feel that something could be accomplished."

2) R. A. McIntosh, Ontario: "I approve of the program, but with war activities uppermost in Canada it may be difficult for us to undertake such work now."

3) R. R. Dykstra, Kansas: "We are interested in the matter and would like to know how much work is likely to be involved and how it is to be financed."

4) R. F. Bourne, Colorado: "I am sympathetic with the idea. We shall be glad to undertake what studies may be appropriate."

5) E. E. Wegner, Washington: "I consider this a worthy and desirable procedure and I would be very happy to help with the program."

6) B. B. Roseboom, Michigan: "This department heartily approves of the general plan and will be glad to coöperate."

7) R. S. Sugg, Alabama: "This plan is practical and should result in a more rapid accumulation of information than if a central laboratory were available. We shall be glad to coöperate."

8) P. W. Burns, Texas: "This contemplated work is one that this department would like to see encouraged. We want to coöperate to the fullest extent."

9) D. W. Ashcraft, Ohio: "I am heartily in favor of the establishment of research fellowships in pharmacology departments to investigate the physiologic action and dosage of the newer drugs."

10) H. D. Bergman, Iowa: "Progress is not made without advanced thinking and planning and it seems to me that such a program might bear fruit. There is at least no harm in thinking about it and discussing it."

With this, and the accumulation of other opinions too voluminous to be incorporated in this report, the Committee closed its files and continued its circular correspondence.

From the correspondence and brief sessions which it has been possible to hold since the opening of the convention, the opinions and recommendations of the Committee are as follows:

1) The veterinary profession at present is not carrying out its just share of pharmacologic investigations.

2) There is eminent need of instituting this type of investigation under the general control and supervision of the AVMA.

3) As this matter affects one of the three major series of working tools of the profession, adequate financial support on the part of the Association would seem to be entirely justified.

4) Coöperation with the proper departments of the various educational institutions appears feasible and might take the forms either of monetary grants or of the institution of research fellowships.

5) Appropriation by the Association of $1,000 for this purpose for the year 1941-1942 is recommended. Expenditures should be made under the jurisdiction of the Committee, on approval of the Board of Governors. The Committee should be empowered to enter into such working agreements with the various educational institutions as may appear desirable, but not to bind the Association financially beyond the Committee's appropriation.

6) It is realized that the Association owes it to the public to maintain the facilities previously offered by this committee for coöperation and consultation. Continuation of this general policy is recommended.

7) This committee again recommends that there be published in the JOURNAL the findings of the courts on veterinary remedies issued by the Food and Drug Administration in its

monthly press releases, and notices of judgments as well as reports of the Federal Trade Commission.

8) The Committee again recommends that all advertising copy on veterinary pharmaceuticals offered for insertion in the JOURNAL be submitted to this committee before acceptance.

Respectfully submitted,

(signed) R. L. MUNDHENK, *Chairman.*
J. G. HARDENBERGH, *Sec'y.*
HARRY CALDWELL,
J. V. LACROIX,
H. J. MILKS,
H. E. MOSKEY.

Bang's Disease

R. R. BIRCH, Chairman

Your committee is gratified to report that more and more herds are being freed from Bang's disease, for this is the goal of all of our efforts to control the malady.

Evidence of this progress is contained in the following statement furnished through the courtesy of Dr. A. E. Wight, Bureau of Animal Industry: "650,000 cattle are being tested each month in the federal-state program alone, a little more than half of the tests being made under the area plan. There are now 391 counties in 23 states classified as 'modified accredited,' 93 of which have been added during the past year. Area testing is being conducted in about 200 additional counties."

During the year there has been furnished by Dr. J. R. Mohler, in a comprehensive report followed by recommendations, a plan through which calfhood vaccination may be made to serve in the eradication of the disease. This plan, wisely, we think, leaves to the individual states the initiative in setting up plans for calfhood vaccination that woud be best adapted to conditions within those states, and at the same time permit, where indicated, the payment of indemnities, federal or state, or both, in conjunction with calfhood vaccination..

From the situation thus created there are emerging three general plans of control, one or more of which can be utilized by the cattle breeders in the several states:

1) Test and immediate elimination with indemnities.

2) Test and immediate elimination with calfhood vaccination and indemnities.

3) Test and gradual elimination with calfhood vaccination and without indemnities.

These plans reflect cumulative experience which teaches that all herds at all times are not best served by a single plan, and that the plan adopted in any herd should be selected according to the existing circumstances surrounding that herd.

Already 33 states have in operation plans for incorporating calfhood vaccination in the cooperative Bang's disease-control work and four other states have similar plans under consideration. This evidence of progress is most encouraging.

Your committee deems it important to state certain guiding principles that will aid in formulating regulations for the control of Bang's disease and in obtaining the greatest possible good from calfhood vaccination:

1) Blood testing of the entire herd more than 4 months of age should precede calfhood vaccination, and periodic testing of the herd should take place subsequently. It is of value in determining the status of the herd before any vaccination is done, in determining the agglutinin response subsequent to vaccination and in providing for the immediate or ultimate elimination of all reacting mature animals.

2) All calfhood vaccination should be done by duly licensed veterinarians under the guidance of livestock sanitary officials. Competent local veterinary advice should be an integral part of all testing programs.

3) All calves vaccinated should be officially identified by distinctive tags or otherwise and, whenever possible, by official recording by state sanitary officials. This is the only way in which a purchaser may be assured of receiving vaccinated animals, and the only way in which vaccination itself can be given a fair trial.

4) Better control should be exerted over the sale of vaccines by biologic firms and other organizations that promote indiscriminate vaccination.

5) Special emphasis should be placed on the necessity for the proper refrigeration and handling of vaccine.

6) In interherd transfers, interstate transfers and sanitary control measures, the following principles should be observed:

a) The status of the herd of origin and the status of the herd of destination are primary considerations in all transfers.

b) Any animal vaccinated as a calf and failing to react when tested at a time more than a month subsequent to vaccination may be accorded the same privileges that apply to nonreacting, unvaccinated animals of the same status in other respects.

c) Vaccinated animals which react after they reach breeding age should be subject to the same restrictions that apply to reacting, nonvaccinated animals of equal status in other respects.

d) Until they reach breeding maturity, vaccinated calves are not likely to be spreaders of Bang bacilli, but traffic of any kind between herds not known to be free from Bang's disease and herds that are free always involves danger.

e) Calfhood vaccination in a given herd should not interfere with the sale of raw

milk from that herd, provided no reacting animals of breeding age are retained therein.

f) Animals that have lost titer following vaccination reactions, and then reacted a second time, do so usually as a result of natural exposure. Payments of indemnities for them is thus as sound as is the payment of indemnities for reactors that have not been vaccinated.

7) In conclusion, your committee again states with all possible emphasis that clean herds are properly the goal of all of our efforts; that these may best be obtained directly through blood testing alone in some herds and areas; indirectly, and through blood testing combined with vaccination, in others; and, lest we forget, your committee again urges skillful herd management, which limits the size of units, provides for raising the young stock as a separate group and furnishes maternity stalls apart from the quarters of the main herd.

Respectfully submitted,

(signed) R. R. BIRCH, *Chairman.*
C. P. BISHOP,
H. S. CAMERON,
C. R. DONHAM,
A. EICHHORN,
R. A. HENDERSHOTT,
W. WISNICKY.

Nomenclature of Disease and Vital Statistics of Domestic Animals

H. C. H. KERNKAMP, Chairman

The special Committee on Nomenclature of Disease and Vital Statistics, together with its collaborators, met in Chicago on December 3, 1940, for the purpose of discussing the collection, assembly and compilation of the material germaine to its assignment. There was manifested at the meeting a profound interest in seeing this work through to an ultimate conclusion.

The Committee fully recognizes that its duties are of a nature that renders progress relatively slow. While its work is still in a formative stage, nevertheless, it now has for study and consideration a plan which, it is believed, will serve as a basis for more specific and detailed discussion at some future meeting.

It was the consense at the meeting last December that the diseases and disorders of the domestic animals to be included in its report be those diseases and disorders known to occur in the domestic animals of North America. It was also the consense that the names and terms should be those that are used in North America to designate the diseases and disorders.

The Committee has again enlisted the assistance of several interested workers, with the view of making its job more complete and useful, who have given of their time and knowledge on the same basis as did the designated committeemen, and this opportunity is taken to thank them for their services. We recommend that the Committee be continued and that all those invited to assist with its work be given the status of committeeman.

Respectfully submitted,

(signed) H. C. H. KERNKAMP, *Chairman.*
F. R. BEAUDETTE,
M. A. EMMERSON,
GEORGE H. HART,
I. A. MERCHANT,
H. W. SCHOENING,
E. A. WATSON.

Legislation

J. G. HARDENBERGH, Chairman

Through Congressman Gillie, a member of this committee, together with other Association members in Washington, close touch is kept with national developments affecting the profession.

During the past year there was only one matter, in which the legislative committee was active, that was carried out through the central office. It related to the Murray Bill (Senate 783) and, although the bill was finally tabled by the Senate Committee on Military Affairs, through the appeal sent out we obtained excellent support for the bill.

That was the bill relating to the exemption of medical and dental students. Congress, of course, hesitated to pass legislation which would provide blanket exemption for any given class.

Later, as you know, rulings were made whereby deferment is granted to certain individuals who are engaged in essential industries and professions. Thus, the veterinary profession was recognized along with the medical and dental professions.

One other bill was brought to the attention of the Committee: H. R. 5531, which has just been discussed here. We sent out a letter to the members of the Committee. Not all of them responded, but, again, that has been in capable hands and you have heard the discussion here tonight.

Respectfully submitted,

(signed) J. G. HARDENBERGH, *Chairman.*
E. M. GILDOW,
G. W. GILLIE,
REUBEN HILTY,
W. H. IVENS.

Poultry Diseases

CLIFF D. CARPENTER, Chairman

Progress has been made in securing a greater interest among general practitioners in the control of poultry diseases. Notable advance is being made in such states as Michigan, Iowa, Missouri and Indiana.

In Michigan two extension schools for veterinarians only were held during the year, with an average attendance of 22. Three additional schools were requested, and this popular type of instruction is to be continued by the state college the coming year.

In Missouri the University of Missouri has for the past two years offered an intensive two-day short course in poultry diseases to veterinarians only. A comprehensive program in poultry-disease control has been carried out by the state college extension veterinarian.

In Iowa the state college in coöperation with the field men of the Bureau of Animal Industry held 15 meetings during the past fiscal year for veterinarians only, with a total attendance of 983. A few of these veterinarians attended as many as four different schools. Several attended three, and a sizeable number attended two. One school had an attendance of 142 veterinarians. Practitioners assisted in all of the clinics.

The accrued results of these Iowa schools are:

1) A great increase in the interest shown by veterinarians in poultry practice over a year ago.

2) An increased number of letters from practitioners concerning poultry problems.

3) Direct requests from veterinarians to have poultry clinics in their localities.

In addition, the extension veterinarian held poultry clinics in 25 counties, especially designed for calling the producers' attention to their disease problems and the desirability of depending upon trained veterinary talent for correct diagnosis.

Indiana has held two extension schools for veterinarians only, during the past six months. Each of these had a regular attendance of approximately 25 veterinarians, with more than 100 veterinarians attending one or more meetings during the two sessions. Regularly scheduled classes were held two evenings a week for a period of eight weeks, including subject matter on breeding, management, sanitation, nutrition, disease and parasite control, with demonstrations and autopsies. These classes expressed enthusiasm for the benefits received.

Purdue University, under whose sponsorship these schools have been held, has included an appropriation in its budget for the next fiscal year to hold three more schools throughout the state. The instructor will be Dr. Frank H. Tucker, practitioner, of Claypool, Ind., who demonstrated fine leadership in the two schools recently completed.

Several other states are either carrying out similar schools or contemplating their initiation.

The Committee wishes to comment favorably upon the excellent poultry clinic at the 1940 AVMA meeting in Washington, D. C., and desires to point out that not only good material and excellent demonstrators were essential to its success, but that the proper location, with respect to other clinics, attracted the attention of the general practitioner. We urge that future poultry clinics be located equally well.

The Committee urges that practitioners make greater use of their state laboratories for verifying clinical diagnoses. An additional value of such a routine practice would be material assistance in promptly identifying new diseases.

The program of the U. S. Regional Poultry Research Laboratory and the 25 coöperating state experiment stations, which is directed toward improvement of viability in poultry, represents the type of coördinated effort in research that should lead toward rapid progress in solving the problems of disease. Your committee looks upon this project as promising much for the poultry industry and the practitioner.

The Committee is sponsoring the distribution to veterinarians of 3,000 copies of "Poultry Information—Please," at cost. This is a 50-page reprint of the proceedings of a symposium on poultry diseases and their control, presented at the forty-fourth annual meeting of the U. S. Live Stock Sanitary Association in Chicago, December 1940.

The price of this separate is 15 cents. Inasmuch as it contains a comprehensive discussion of bacterial, virus, parasitic and nutritional diseases, we urge practitioners to use it as a guide to successful poultry practice.

Changes in the National Poultry Improvement Plan

Of the changes made in the pullorum-disease control phase of the National Poultry Improvement Plan, the following are of interest to the veterinary profession. These changes were adopted at the group conference in Chicago, June 17, 1941:

1) The minimum age at which chickens may be tested has been raised from 4 months to 5 months.

2) Reactor tolerance (previously 10 per

cent) has been lowered as follows:

Fewer than 9 per cent reactors in 1941-42
Fewer than 8 per cent reactors in 1942-43
Fewer than 7 per cent reactors in 1943-44
Fewer than 6 per cent reactors in 1944-45
Fewer than 5 per cent reactors in 1945-on

This graduated tolerance is in keeping with this committee's recommendation incorporated in the 1940 annual report.

3) A new class in the National Poultry Improvement Plan has been established, entitled "U. S. Pullorum Controlled." All breeders in this class shall be tested for pullorum disease under the supervision of an official state agency and contain fewer than 2 per cent reactors.

NEW DEVELOPMENTS IN POULTRY-DISEASE RESEARCH

1) The Washington station at Pullman reports that phenothiazine, although not a specific for the prevention or cure of infectious enterohepatitis, is highly valuable in removing the *Heterakis gallinae*, which is the factor of first importance in the spread of this serious turkey disease. An efficiency of approximately 95 per cent is reported and it is suggested that if blackhead appears in a flock, 1 lb. of phenothiazine (for each 1,000 turkeys) be mixed with as much mash as the birds will consume readily in one hour. All feed should be withheld for a few hours preceding treatment. When the drug has been mixed with the mash, moisten slightly to make it more attractive and to prevent waste. It is further suggested that if the birds must remain in contact with infested premises, the treatment be repeated 4 to 6 weeks later. The drug is almost entirely nontoxic to turkeys, and in the above-recommended dosage is harmless, although it is said to be ineffective in turkeys showing clinical evidence of the disease.

2) The Rhode Island station reports on the chemotherapeutic value of sulfathiazole in preventing and treating infectious coryza in chickens. Workers at that station conclude that in a limited number of experiments, concentrations of 0.25, 0.5, and 1 Gm. of sulfathiazole added to each 30 Gm. of mash proved effective in the prevention of clinical symptoms of infectious coryza following inoculations of virulent cultures.

Further, the material also seemed to be of some value in hastening the recovery of infected birds. The treated birds showed no dislike for the feed. They conclude that the use of the drug does not destroy all the organisms, but restricts their growth sufficiently to prevent clinical symptoms, using as proof of this the fact that when the drug was removed from the mash, the birds developed clinical symptoms of infectious coryza.

Two days after treatment with 2 Gm. of sulfathiazole per bird, administered daily for four days, seriously infected birds showed marked improvement, as indicated by a cessation of the nasal exudation and a desire to eat. For three additional days the dosing was continued at the rate of 0.5 Gm. per 30 Gm. of feed, then discontinued. They observed no signs of reinfection during the following week. Toxic symptoms were not noted among the treated birds.

They further conclude that blood from birds receiving sulfathiazole had a marked retarding effect on the growth of *Hemophilus gallinarum* in cultures.

3) The California station reports on the vaccination of chickens with avian mixed bacterin for the prevention and control of infectious coryza. Investigators there found no protection was afforded against contact exposure 9 to 24 days following the administration of three 1-cc. doses, given at three- to four-day intervals. They recommend a more exhaustive study of this problem.

4) Lead arsenate was found to be effective for the removal of chicken tapeworms by the Beltsville Research Center of the U. S. Department of Agriculture, but its toxicity is too great for general use. This same station reports that organic and inorganic tin compounds show promise as teniacides in chickens. Mixtures containing a small amount of synthetic pelletierine hydrochloride and one of the following tin compounds—tin oleate, stannous oxalate, stannous oxide hydrate or stannous tartrate—effectively removed *Raillietina cesticillus*. It is hoped that future investigations will disclose the most effective and economical of these mixtures.

5) The Storrs (Conn.) station reports that an infection, with a resulting high mortality, followed the application of "specs" which were used to prevent cannibalistic practices. At autopsy fatal cases disclosed staphylococcic arthritis.

6) The Kentucky station reports that aqueous colloidal sulfur added to the mash in concentrations of 10 per cent was effective in protecting young chicks from mass doses of *Eimeria tenella*, when administered directly into the crop.

The New York station reports that flowers of sulfur incorporated in the mash in a 5 per cent concentration exerts the same beneficial effect in preventing infections with *Eimeria necatrix* as they earlier reported for *E. tenella*. They report no value in treating chickens already infected. They recommend that when *E. necatrix* is diagnosed, 5 per cent flowers of sulfur be added to the ration for one week, as a temporary expedient while corrective sanitary measures are made effective.

They further report that sulfaguanidine in concentrations as low as 0.5 per cent of the

ration prevented infections of chickens with *E. praecox*, *E. mitis*, *E. maxima*, and *E. hagani*, while 1 per cent was effective in reducing markedly the severity of cecal lesions due to *E. tenella* and 1.5 per cent was effective against *E. necatrix*.

7) Investigations at the Storrs station continue to reveal important data concerning the occurrence and transmission of avian encephalomyelitis, or epidemic tremor. This virus disease, of considerable significance in New England, and now appearing in some of the southern, central and western states, may be confused clinically with other diseases affecting chickens, and the Storrs station concludes that the diagnosis of avian encephalomyelitis should be based upon histologic methods.

NEW DEVELOPMENTS IN POULTRY NUTRITION

New findings have been added to the knowledge of poultry nutrition and have resulted in definite contributions to the control of deficiency diseases.

1) It has been shown that a deficiency of vitamin H produces in chicks a form of dermatosis. This vitamin has been identified as the substance biotin, the chemical composition of which is not yet known. It is one of the most potent of accessory factors per unit of weight. The so-called egg-white injury which results from ingestion of unheated egg white has been shown to be due to a deficiency of biotin. Egg white contains biotin, but it is necessary to heat the substance before the biotin can be utilized by the chick. Thus, what appeared to be a toxicity caused by a foodstuff was found to be a deficiency of an essential factor present in the foodstuff, but in an unavailable form.

2) Pantothenic acid has been added to the vitamin B-G complex. Its deficiency causes a dermatosis somewhat similar to that of biotin, a definite neuropathology of the spinal cord, involution of the thymus gland, liver damage including fatty livers, and keratitis. Recent work has led to the chemical identification and synthesis of this vitamin, which may be obtained commercially as calcium pantothenate.

3) It has been shown, likewise, that highly absorptive charcoals added to the ration render a number of nutritive values in the ration unavailable to the chick.

4) Leg disorders of chickens continue to be studied. The inclusion of vitamin D and, recently, manganese has allowed the poultryman to produce chickens at any season of the year without incurring losses from these deficiences. More recently it was found that choline is also required by poultry to prevent leg abnormalities. Turkeys require more than chickens, but most practical poultry rations are not considered to be seriously deficient in this substance. Thus, some of the factors that have an influence on normal development of the leg bones are vitamin D, manganese, calcium-phosphorus ratio and levels, magnesium level, choline and several unidentified substances contained in liver. It has been postulated that environment, such as high temperature and crowding, as well as certain pathologic states, such as enteritis, may impair the availability or utilization of such dietary factors.

5) Work on the protein requirements has shown that poultry have amino acid requirements different from other animals. Clycine has a growth-promoting effect with chicks, although it is not essential in the diet of rats. In contrast to this, methionine will replace choline in the diet of the rat, but not of the chick.

6) Observations on the influence of feeding upon cannibalism have indicated the favorable effect of higher-fiber foodstuffs, and of all-mash feeding as compared with grain and mash feeding. It has been suggested that there is a decrease in the incidence of cannibalism with an increase in the time required for food consumption, which may explain the above results.

Doubling the amount of common salt in the ration, *e. g.*, from 0.5 to 1 per cent or from 1 to 2 per cent, over a period of four to five days may sometimes stop outbreaks of cannibalism in chickens and other birds.

INFECTIOUS BRONCHITIS

Infectious bronchitis continues to be a serious economic menace to the poultry industry. This disease is easily confused with coryza and infectious laryngotracheitis, and the practicing veterinarian frequently needs to secure a laboratory differential diagnosis.

Of chief importance in controlling and preventing the spread of this disease, the veterinarian should consider the following:

1) The carrier problem. This involves the adult birds on the farm, purchases of started chicks that may have been exposed, as well as exposed or infected day-old chicks.

2) Employing adequate means of cleaning up following an outbreak in a hatchery, broiler plant or brooder house.

3) The necessity of discouraging the addition of susceptible chicks, after an outbreak occurs in a broiler plant, without first removing the recovered carriers from the premises and cleaning up.

4) That mortality from infectious bronchitis is dependent upon the age at the time of exposure. The younger the chicks, the higher the mortality.

5) Infectious bronchitis is being reported with greater frequency in chickens during the laying season. At this age, the death losses are not severe, but the resulting shrinkage in egg production and other undesirable characters of egg production, particularly in hatching egg flocks, are of considerable economic importance. In some instances it has been

more profitable to dispose of the flock than to continue through the laying season.

POULTRY-DISEASE NOMENCLATURE

The Committee regrets that the check list of mycoses can not be included in this year's report as planned. Our committee is collaborating with others working on veterinary nomenclature and the mycoses check list will be included in next year's report.

RECOMMENDATIONS

The Committee offers the following recommendations for your approval:

1) That all veterinary colleges and veterinary departments of state colleges, in states where refresher courses in poultry-disease control are not being conducted for veterinarians, study the curriculums, methods and results obtained in the states of Michigan, Indiana, Illinois, Iowa, Missouri and others, and take steps to bring needed help to their constituents, both producers and veterinarians.

2) As a means of further assisting the general practitioner with problems of poultry practice, we recommend that at AVMA annual meetings the Section on Poultry, before which papers pertaining to poultry practice are read, be held at a time not in a conflict with the Section on General Practice.

3) Upon surveying the activities of extension veterinarians throughout the country, it is noted that some extension veterinarians do not include poultry in their activities. We recommend that all extension veterinarians include poultry in their project work.

Respectfully submitted,

(Signed) CLIFF D. CARPENTER, *Chairman.*
C. A. BRANDLY, T. P. POLK,
W. E. BRANDNER, K. W. STOUDER.
A. J. DURANT,

Resolutions

WM. MOORE, Acting Chairman

At the request of President Wight, I am acting in the place of Dr. Campbell, chairman of the Committee on Resolutions, who is now in the military service at Fort Bliss, Texas, and will not be able to attend this meeting. The Committee wishes to present four resolutions.

No. 1.

WHEREAS, a recent survey indicates that a national over-all shortage of veterinarians exists and

WHEREAS, the veterinary profession is an activity essential to national health and

WHEREAS, this situation has been brought to the attention of the Selective Service System with a view to granting deferment to veterinarians and veterinary students; therefore, be it

RESOLVED: That this Association extend to Brig. Gen. Lewis B. Hershey, deputy director of the Selective Service System, its thanks and appreciation for his consideration and action concerning deferment of veterinarians and veterinary students, and be it further

RESOLVED: That a copy of this resolution be sent to General Hershey.

No. 2.

WHEREAS, the emergency facing this nation has continued since our last annual meeting and

WHEREAS, added responsibilities have been placed upon all of our people and

WHEREAS, the veterinary profession is aware of its responsibility, both civil and military, in this emergency; therefore, be it

RESOLVED: That the American Veterinary Medical Association, in convention assembled again, pledges to the President and the Government of the United States its full support and service in any capacity, civil or military, which will contribute to the success of the program for national security, and be it further

RESOLVED: That a copy of this resolution be sent to the President of the United States, to the Secretary of War, and to the Surgeon General of the Army.

No. 3.

WHEREAS, the seventy-eighth annual meeting of the American Veterinary Medical Association has an outstanding attendance and

WHEREAS, the program, facilities and entertainment are of the highest order and

WHEREAS, the scientific, technical and educational exhibits are outstanding and depict the progress made by the profession; therefore, be it

RESOLVED: That the American Veterinary Medical Association, in convention assembled, does hereby express its thanks, appreciation and congratulations to the Committee on Local Arrangements, to the press, radio and all others who have worked so diligently and contributed so freely to insure this successful meeting.

No. 4.

WHEREAS, the Secretary of the Treasury has now announced plans whereby the citizens can aid in financing the National Defense Program by the purchase of Defense Savings Bonds and Stamps, and

WHEREAS, the American Veterinary Medical Association has pledged its whole-hearted support of the National Defense Program; therefore, be it

RESOLVED: that the American Veterinary Medical Association pledges its assistance in carrying out this program to help finance the National Defense Program by buying and boosting Defense Bonds and Stamps.

Respectfully submitted,

D. M. CAMPBELL, *Chairman.*
(signed) WM. MOORE, *Acting Chrm.*
A. J. DEFOSSET, JOHN H. GILLMANN,
E. P. FLOWER, JOHN L. TYLER,
C. P. ZEPP.

Representative to the Horse and Mule Association of America

T. A. SIGLER

The Horse and Mule Association of America has completed its twenty-first year. It was organized and incorporated in January 1920 as a corporation not for profit, but one for the benefit of the horses and horse producers of North America.

Much has been accomplished by this association in those 21 years. Prior to the establishment of this organization, the horse industry was an unorganized body, nationally. There were a few state groups, however.

During the past year they have centered their work, as they have done in the past, on those things which would encourage the raising and use of horses and mules. They have fought drastic legislation against the horse and have fought the scare of equine encephalomyelitis. A story was put up for distribution, leaflet No. 348, on the control of this disease and it was broadcast throughout the United States.

The main job was to drive home more clearly than ever the importance of using horses and mules for farm work. They prepared, with aid and assistance of some of the leading men in the industry, booklet No. 347, on farm-raised horse power, which was published and distributed at the same time as the pamphlet telling of the control of sleeping sickness.

Quoting Ellis McFarland in the *Breeders' Gazette*, June 1941: "When the uptrend in the horse business comes—and it is bound to come with such wide preparations for defense and future shortage of fuel for power machinery—the wise farmer will be ready to take advantage of the higher prices that will be offered for work stock. The surplus animals he is now raising will be recorded and ready for sale. Good horses are always in demand. Moreover, when Percheron breeding operations abroad are resumed, the American farmer will be called upon to provide the seed stock."

Quoting from the *Indianapolis News*, July 11, 1941, an article by Howard J. Brant, secretary-treasurer of the Belgian Draft Horse Corporation of America: Mr. Brant says the German invasion so disrupted the breeding of these big beasts in their native land that there probably will be no exports to America in our lifetime. "If the war ends with Germany dominating Belgium," Brant predicts, "my personal opinion is that American breeders would not accept any Nazi-offered pedigrees. There would be no assurance that any animals offered for export were of pure blood." Brant has tried unsuccessfully to get pedigrees of sires of some of the last Belgians imported in January 1940.

There is no lack of Belgian breeding stock in the United States and Canada. The huge animals, whose ancestors carried armored crusaders, have been imported for more than 50 years.

"If you want to see the best Belgians now," Brant says, "you should go to the Belgian shows at Waterloo, Iowa, and the International Livestock Show at Chicago, or attend the state fairs of Indiana, Illinois, Iowa and Ohio."

There are 13,237 breeders of horses and mules in the country and the combined wealth of the different breeds of horses — race, show and purebreds—will more than exceed the wealth of all other animals raised in the nation. This is due to the fact that some of the valuable sires are priceless and their earnings run into hundreds of thousands.

Eighteen years of pulling contests have been completed, the first being held in 1923 at the Iowa State Fair.

The contests were started for tests and educational purposes. They have proved to be a great drawing card at fairs. This has been fortunate for horsemen, for it has given them substantial prizes to compete for and has encouraged owners to seek out, purchase and train exceptionally good prospects.

Best results have been achieved in those states where the dynamometer has been handled by the extension departments. Constant emphasis is then placed on the purposes of the contests, *to wit:*

1) To demonstrate the value of type, soundness, and proper breeding in the selection of horses and mules for long and arduous draft work.

2) To ascertain and to demonstrate the proper method of training and conditioning horses and mules for long and severe draft work.

3) To encourage horsemanship in fitting harness and shoes and in driving.

4) To demonstrate the maximum pulling capacity of the horse and mule.

The National Horse Pulling Contest will be held at Syracuse, N. Y., in conjunction with the New York state fair on August 25 to 28, inclusive, 1941. The contest has been officially designated as the national for 1941 by the Horse and Mule Association of America, whose rules and regulations control all official pulling contests held throughout the world. The New York State College dynamometer will be used, and the men in charge of pulling contests in New York, and such other states as may be available, will be officials in the national contest.

Cash premiums aggregate $2,000. Pairs under

3,000 lb. (neither horse to exceed 16 hands measured from top of shoes) will compete for $1,000; preliminaries will be held August 25 and finals for this class on August 26. The pairs 3,000 lb. and over will compete for $1,000; preliminaries will be held August 27 and finals on August 28.

Pleasure-horse use has gained greatly during the past three years. Much of the work to encourage this has been inspired by the HMAA, working through riding academies, riding masters and breeders of riding horses throughout the United States.

Much information has been sent to them and more will be sent during the coming year. The effectiveness of this work and the growing interest in the riding horse are well attested by the sale held by Mr. Harry McNair in Chicago, where 215 riding horses sold for $93,236, an average of $433 per head. There is a widespread keen interest in riding which can be fostered all over the country. It will benefit farmers who have grain and hay to sell and men who have riding horses to sell, as well as men who have equipment to sell. There has been a falling off in the draft-horse field somewhat, but the increase in pleasure-horse use has more than offset this in the horse business in general.

Interest in horse shows has gained all over the country. In a recent interview, Phelps Spencer, editor of *The National Horseman*, Louisville, Ky., said that there is a 20 per cent increase in horse shows over the nation this year. "The agricultural department of the Commonwealth of Kentucky," he stated, "reports that 68 fairs will be held in the Blue Grass state this season, and at many of them horse shows will be given in connection. As a result, not only the breeding, but ownership of horses for tanbark contests will be greatly increased. In fact, it's the county fairs that act as feeders for the various state fairs, and in so saying, the 1941 Kentucky state fair should be the most outstanding given by that organization in recent years."

We, in Indiana, feel that our show is becoming one of the largest and finest in the country. Indiana, and Indianapolis, are fast becoming the capital of the saddle-horse industry. We can possibly boast of more saddle clubs than any other state or city, with the exception of Chicago. There are many saddle clubs in and around Indianapolis. We have a state organization and a journal printed monthly, recording the activities of this association. Many of the organizations in counties throughout the state are affiliated with the state association. Your reporter is a member of the executive body of this Indiana Saddle Horse Association. Each Sunday in the society section of the *Indianapolis Sunday Star*, more than two columns are given under the title "Along Hoosier Saddle Trails," being the happenings of the various saddle clubs throughout the state.

We feel that what has been accomplished for Indiana for its horse interests can be accomplished for many other states in the Union.

Each fall, following the state fair, we have our annual horse round-up, with a thousand horses in the parade, held on the race track at the state fair grounds in Indianapolis.

Many valuable prizes and trophies are given for different classes. This year it will be preceded the night before by a big barbecue at the fair grounds for the participants.

Mr. E. A. Crane, the chairman of our round-up, says, "I believe it to be the biggest thing of the kind in the United States." He further states, "In the horse world, Cheyenne, Wyoming, is known for its rodeo; Lexington, Kentucky, is known for the Trots; Louisville, Kentucky, is known for the Derby; and Indianapolis for the Round-Up."

The Horse and Mule Association of America has helped to bring about better conditions for, and a broader and better understanding of the horse, and has helped to foster the horse's cause whenever possible.

The Association appreciates the loyal coöperation and financial support given by the AVMA. This has helped to carry on the steadily increasing campaign waged during the past 21 years, to encourage the breeding and raising of horses and mules.

Respectfully submitted,
(signed) T. A. SIGLER.

Representative to the National Research Council

H. E. BIESTER

The National Research Council is composed of a number of divisions. One of them is the Division of Medical Sciences, to which the representative of the AVMA is assigned. A number of committees are organized under the various divisions of the Council, in some instances coming under interdivisional jurisdiction. The Committee on Medical Problems Common to Animals and Man is one of the latter, its personnel being comprised of members of the Division of Medical Sciences and of the Division of Biology and Agriculture. While serving as chairman of this committee since 1939, it became evident that the interests of the members were too divergent and that a community of interests was lacking. After careful consideration it was agreed to propose to the divisional chairmen that a new committee be created to deal with problems of parasitology and that the present Committee on Medical Problems Common to Animals and

Man be reorganized and its efforts be directed to several phases of veterinary medicine and to one or two specific infectious disease problems. The results of these endeavors will be included in the report to be made by Dr. Eichhorn, the present representative on the Council, at the 1942 meeting of the AVMA.

Respectfully submitted,

(signed) H. E. BIESTER.

Representative to the American Association for the Advancement of Science

WARD GILTNER

Your representative believes that the members might be interested in some information revealed by a report of the president of the American Association for the Advancement of Science, to the Council, made December 27, 1940. The total membership was 21,067. There are 16 sections, A to Q: mathematics, physics, chemistry, astronomy, geology and geography, zoölogical sciences, botanical sciences, anthropology, psychology, social and economic sciences, history and philological sciences, engineering, medical sciences, agriculture, industrial and education.

Section N, medical sciences, with which we are affiliated, has the largest membership, 14.65 per cent. The 76 affiliated and 27 associated societies of the AAAS have a membership, respectively, of 705,500 and 247,400, or a total of 952,900. The membership of individual affiliated societies represented in section N is as follows:

American Medical Association	113,400
American Public Health Association	6,700
American Veterinary Medical Association	6,700
American Pharmaceutical Association	4,000
American Academy of Ophthalmology and Otolaryngology	3,000
American Psychiatric Association	2,300

The sixth Philadelphia meeting of the AAAS was held between Christmas 1940 and the New Year. Irving Langmuir of the General Electric Company was elected president. The program of section N, which was devoted entirely to a symposium on human malaria as it exists in North America, Central America and the West Indies, was sponsored jointly by the American Society of Parasitologists, the American Society of Tropical Medicine and the National Malaria Committee. Two years ago, when those charged with the development of the activities of the section selected this disease for discussion in a symposium, there were no intimations that the culmination of their efforts would coincide with a national crisis in which the symposium would constitute an outstanding contribution to national defense, for the concentration of young men in military camps located in areas where malaria is indigenous presents an important public health problem. Thus, the thorough review of our fundamental knowledge concerning the parasites, the distribution of known mosquito vectors, methods of diagnosis and treatment as well as technics of control will be available to the various governmental agencies at this time of emergency.

The midsummer meeting was held June 23 to 28, 1941, at Durham, N. H. The AVMA was urged to hold its annual meeting in coöperation with the AAAS, but, of course, this was not possible.

Respectfully submitted,

WARD GILTNER.

Salaries of Bureau Veterinarians

There is probably no better way of advancing the status of the veterinary profession than to advance the salaries of the members in the BAI forces, for as these salaries go, so goes our rating by the people. Their pay should correspond to the preparatory college training and experience required of them, not to mention the importance of their work in behalf of public welfare. Their task is arduous, difficult, tedious, technical, requiring in addition to scientific training a degree of good judgment possessed by few groups of equal numbers in the public service, and they work in the nation's greatest industry. There should be no discrimination in the pay of groups required to possess equal qualifications, and, therefore, we have no obligation greater than to see that our group is not overlooked in the gradation of salaries.

With things as they are today, the fields of research, commercial work in supply and industrial laboratories, teaching in veterinary and agricultural colleges, and inviting fields of private practice may go combing through the trained, disciplined Bureau force for efficient personnel and offering higher salaries than the profession has asked the government to pay. The responsibility rests upon the national association and the results upon the effort made. As Algeron Sidney wrote, "God helps those who helps themselves."

". . . These pigs were marketed a short time ago at a price of $8.90 per cwt., when the top price paid that day was $8.95."

So ends a letter from an Illinois veterinarian* who recommended Cutter B.T.V. to a client who had complained of the arrested growth following serum-virus.

Field experience has proven that a single dose protects against cholera until marketing — just as each lot of B.T.V. must prove its immunizing ability in the laboratory, by protecting susceptible pigs against a subsequent dose of virus which uniformly kills the controls.

Assure greater profits for your clients by avoiding virus "stunting"—and less grief for yourself by avoiding virus "breaks" and flare-ups of secondary infections. Vaccinate with Cutter B. T. V.—the *safe* hog cholera vaccine that eliminates disease-producing virus from the field.

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ARMOUR AND COMPANY
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KANSAS CITY, KANSAS

An' Related Topics

The Vitamins of Longevity

The common saying "Old as Methuselah" invariably brings the retort that the prehistoric ancients didn't know their years. But, inasmuch as the revolution of the earth around the sun has not changed since the year 4004 B. C., the year when Adam and Eve began to lift the curtain of the misty past, was the same year we know.

Everyone knows that Adam and Eve had two sons—Cain and Abel—but few cultivate a close acquaintance with the biography of their third son—Seth—who was to become the ancestor of all mankind to thereafter inhabit the earth. The lineage of Seth traces down directly to Noah and his ante- and post-deluge descendants.

No sharp line of demarkation is now drawn between inspirational (sacred) and secular history. Historians do not attempt to do so, knowing that there is nothing more reliable in history than traditions stamped as indelibly upon the human mind as those of our Bible and other "bibles." According to inspirational history, Adam and Eve were 130 years old when Seth, the dad of all of us, was born. The names and the ages of his descendants are as follows:

Name	*Age*
Seth, son of Adam	912
Enos, son of Seth	905
Cainan, son of Enos	910
Malhaleel, son of Cainan	865
Jared, son of Malhaleel	962
Enoch, son of Jared	365
Methuselah, son of Enoch	969
Lamech, son of Methuselah	777
Noah, son of Lamech	950

With Shem, Ham and Japheth, the three sons of Noah and the progenitors of the present population of the earth, longevity declined. The deluge came about 1,400 years after Adam and Eve and while Noah lived to be a very old man, one searches the pages of ancient history in vain for men as old as were his immediate ancestors. Did the deluge disperse disease over the surface of the earth or did it remove life-

(Continued on page xviii)

Confidence *in* DISTEMPER CONTROL

AS THE FALL AND WINTER MONTHS approach with their conditions conducive to respiratory diseases in the dog, veterinarians again place implicit confidence in Lederle's biologics for distemper control. Twelve years of successful use in everyday veterinary practice supported by confirming parallel research conducted on an extensive scale, have been responsible for the widespread professional acceptance of immunization with "Canine Distemper Vaccine and Virus, *Lederle*" (Laidlaw-Dunkin Method).

"Anti-Canine Distemper Serum, *Lederle,*" has earned its place in the armamentarium of the practitioner as the especially useful agent for temporary protection as well as in the treatment of the disease in the initial stages.

Also available

For infections secondary to distemper or occurring as individual entities, the following formulas are of corresponding benefits:

MIXED BACTERIN (Canine), Formula No. 1, *Lederle*

This bacterin consists of killed bacteria isolated from dogs.

FORMULA:

Brucella bronchiseptica	40%
Streptococcus (pyogenic)	20%
Pasteurella caniseptica	20%
Staphylococcus albus	10%
Staphylococcus aureus	10%

MIXED BACTERIN (Canine), Formula No. 2, *Lederle*

This bacterin consists of killed bacteria isolated from dogs.

FORMULA:

Salmonella enteritidis	40%
Salmonella schottmulleri	40%
Escherichia coli	10%
Streptococcus (pyogenic)	10%

Packages: 20 cc. vial.

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LITERATURE UPON REQUEST

*Trade Mark Reg. U. S. Pat. Off. Word "Perandren" identifies the product as testosterone propionate of Ciba's manufacture. Available through usual trade channels.

CIBA PHARMACEUTICAL PRODUCTS, INC.
Summit, New Jersey

An' Related Topics

(*Continued from page xvi*)

giving elements that science is now seeking to discover—the vitamins of longevity?

Nothing in this bit of prose can be used to stop the pain of colic, cure a spavin or straighten out a dystocia, but it might contain some food for the gray matter that does the planning.

The Pigeon Problem

Tolerated if not encouraged, pigeons play a part in city life. *Non obstante* that they do damage to buildings, these flocks are veritable love birds to city children, who enjoy feeding them when they light in open places for their crumbs. In London, where pigeons were nourished by the crumbs of the cockney's table, says *Our Dumb Animals*, it is now forbidden to allow them even that concession, and many are starving. The pigeon problem is a difficult one. Public compassion for such winged creatures on the one hand and the damage they do on the other are not easy to handle.

Bloodhound Club of America

The Bloodhound Club of America has been founded for the advancement of that breed. Its first annual show will be held in Chicago in 1942. Captain Will Judy, editor of *Dog World*, has consented to act as the president until the first meeting; Leon F. Whitney, canine specialist of Orange, Conn., is one of the members of the advisory committee; the secretary is Edd Armstrong of Long Beach, Calif.—a geographic distribution of officials, indicating that the club is certainly national in character.

Allergy

Cheese does not prove equally injurious to all men.—*Hippocrates.*

What is good for some may be fierce poison for others.—*Lucretius.*

What's one man's poison, signor, is another's meat or drink.—*From Love's Cure.*

(*Continued on page xx*)

NEVER A SINGLE SICK DAY

due to diet-caused ailments!

Pard exclusively has kept 5 successive generations, at Swift's Kennels, full of pep—in A-1 condition!

The proof of Pard is in the feeding. Whether it's the Pard-fed Cocker Spaniels shown above or the Pard-fed Chow Chows and Wire-Haired Fox Terriers also at Swift's Kennels! These dogs—5 successive generations of them—have never suffered from listlessness, excessive shedding, diarrhea, or any diet-caused ailment. Pep! Conformation! General condition! *Their record is magnificent.*

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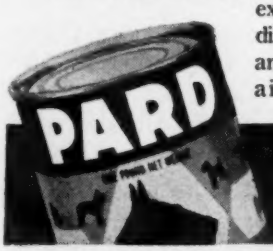

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In a sufficient amount of aromatic oil to make further dilution unnecessary.

You'll Need This Preparation Many a Time Before Spring Comes Again

BETTER KEEP A GOOD SUPPLY ON HAND

Pint 55c Quart 85c Gallon $2.25

Sample on Request

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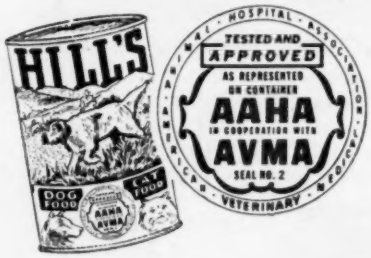

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Tested and Approved.

Write for sample

HILL PACKING CO.
TOPEKA, KAN.

An' Related Topics

(Continued from page xviii)

Better Meals for Tomorrow

Research is on the march as never before, since in the advance of science only the determined facts are counted. Because of the publicity given to discoveries in every field, laymen are led to believe that little is left to be accomplished. Yet, the surface has hardly been scratched. Asked what process, product or material should be developed, industrialists have listed 589 unsolved problems. Of these, 44 concern national defense and 32, specific food problems.

Food is the world's greatest commodity. One third of the merchandise on the grocer's shelves, unknown a few years ago, are the products of research. The synthesis of vitamins has changed the conception of nutrition. Despite fewer working hours, more recreation and slenderizing, the number of food-processing factories has increased during the past ten years. Food prices are lower. The quality of food has been definitely improved and *per capita* consumption increased. Food may be the deciding factor in the present international strife. The health of the civilian is now regarded as important as that of the soldier. England is emphasizing that fact. The aim in food processing is to improve nutritional values.

Although the people's nutrition has improved, the proportion of physically unfit is about the same as in World War I. It requires years for a nation to improve the physique of its people. The food product of the future will stipulate its vitamin content. Winter milk will equal summer milk in vitamins A and D.

Prepared food saves 60 million woman-work hours annually. Less time is devoted to preparing meals. Almost every food can be obtained in packages—fresh, full weight and properly labeled. The kitchen is not heavily stocked. Buying is hand-to-mouth. [*Water, Lewis W. Better Meals for Tomorrow. Certified Milk, xvi (March 1941), pp. 3, 19, 20, 22.*]

(Continued on page xxii)

CANEX

will control Follicular Mange

Many people try one home remedy after another in treating follicular mange of the dog, sometimes with moderate improvement, but seldom with complete success. After repeated failures, they are particularly well pleased with the results obtained by the veterinarian who uses Canex.

In addition to rendering a valuable service to these clients, the results help to build prestige for the veterinarian among those who are prone to employ home treatment and who bring their pets to the professional man only as a last resort.

Canex is available from licensed veterinary supply houses

OUTSTANDING ADVANTAGES OF
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VETERINARY COLLEGE of Vienna graduate, 30 years of experience, wants position in any capacity with veterinarian in mixed practice. Excellent references. Address: "MR," c/o Journal of the AVMA.

YOUNG WOMAN, capable, intelligent, high school graduate; wants position assisting operations and caring for patients in small animal hospital. 11 years of kennel experience. Good driver, typist. Address: "NJ," c/o Journal of the AVMA.

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DOG SENTIMENT CARDS for office wall, set of 12, 60 cents. Judy's *Dog Encyclopedia*, all dog subjects, $5. *Dog World* monthly, $2 for one year; $3 for 2 years; $5 for 5 years. JUDY PUBLISHING COMPANY, 3323 Michigan Blvd., Chicago, Ill.

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Veterinary and Animal Feeding Products Division

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An' Related Topics

(Continued from page xx)

Ivy Poisoning in Winter

Added to a vanishing cream, 10 per cent of sodium perborate or potassium periodate rubbed into the skin, prevents ivy poisoning even after long and intimate exposure to the plant. To be remembered is the fact that winter exposure to the stalk and whitish berries of poison ivy is as dangerous as summertime exposure to the leaves.—*U. S. Public Health Service.*

Our Approved Medical Personnel

According to testimony given to the Senate military committee by Editor Fishbein[1] of the American Medical Association there are 179,000 licensed physicians in the United States, 155,000 of whom are engaged in the several branches of application, and 118,000 have credentials approved by organized medicine.

During 1940[2] there were 9,115 licenses granted: 6,277 by examination and 2,838 by reciprocity and endorsement. The latter include some hold-overs from 1939. Four states issued over 500 licenses each: New York, 1,290; Illinois, 690; California, 608; and Pennsylvania, 561. The totals are approximate, since a few were licensed in more than one state.

During last year (1940) medical boards examined 7,921 applicants for license to practice medicine in the United States and its territories. Of this number 1,630 (20.7%) failed. The greatest number of failures came from medical colleges outside of the United States and Canada. The number of foreign graduates (mainly European) was 2,082. Of these, 54.7 per cent failed to pass.

The applicants of 1940 came from 203 medical schools, 106 of which were foreign schools, not including Canadian. The credentials of foreign applicants have been

[1]Hearings before the Committee on Military Affairs, United States Senate, First Session, March, 1941.

[2]State Board Number, J.A.M.A., May 3, 1941.

(Continued on page xxiv)

A New Veterinary Anthelmintic for oral administration or mixing with feed

NEMAZENE TABLETS

(Phenothiazine, 12.5 Grams)

To the medicinal grade of phenothiazine contained in each Nemazene Tablet we have added a special "wetting agent" which hastens disintegration—about 1 minute in warm water. The resulting uniform suspension can be readily and quickly mixed with feed or given as a drench, without preliminary fasting. Animals also swallow the tablets readily when administered with Nemazene Forceps or a balling gun.

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For descriptive literature and detailed information address

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FOR CANINE BLACK TONGUE

NICOPATIS

(Nicotinic Acid with Liver Extract)

Nicotinic Acid in combination with Liver Extract, according to veterinary clinicians, is much more effective than nicotinic acid alone. The hematopoietic action of the liver improves the blood and speeds up recovery.

Each cc contains: Sodium Nicotinate equivalent to Nicotinic Acid, 100 mg. (10%); with Liver Extract, to represent fresh liver, 25 Gm.; with Phenol, 0.5% as a preservative.

FOR PARENTERAL ADMINISTRATION

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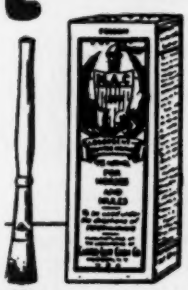

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The Originators of Packaged Medicines for Veterinarians

HUDSON, N. Y.

An' Related Topics

(*Continued from page xxii*)

difficult to verify recently by correspondence. While the majority of these examinees were foreign born, the number includes American citizens educated abroad. In 1937-1938, there were 1,346 Americans[2] enrolled in foreign medical schools.

Since 1930, the migration of physicians to the United States has been gradually mounting: 167 in 1930 as compared with 2,092 in 1940. The percentage of failures, likewise, has increased: 44.9 per cent in 1930 and 54.7 in 1940. There is little consolation to be found in these failures for any one country or any one of the foreign schools in the analysis of the figures. The failures among the graduates of American and Canadian schools average around 20 per cent.

A survey of the medical situation as told in this report shows that organized medicine is a watchful guardian and also that there is plenty to be watched in the eternal struggle to keep the medical house in order.

Pets and Tolerated Animals

The adoption of animals as pets offers an interesting chapter, throwing light, perhaps, on the process of domestication treated in this paper.* The dominance of man over animals, growing more and more from the earliest periods of which we know, would indicate the presence of pets and tolerated animals at almost all periods. The abstraction from the environment of small animals as pets and commensurals is usually a temporary matter and it is likely that, for the most part, little of economic value ensues. The harboring of pets seems to be a human trait, but is reflected in nature by various contacts of one animal with another.

---

*Hough, W., Smithsonian Institute. The domestication of animals. The Scientific Monthly, xxxix (Aug. 1934), pp. 144-150.

[2]The high percentages of failures by foreign school graduates is due in part to Americans who go abroad for medical study because they were rejected for one reason or other by American colleges.

(*Continued on page xxvi*)

4

IMPORTANT AIDS IN SMALL-ANIMAL PRACTICE

Elixir B-G-Phos
This stimulating tonic combines *natural* Vitamin B-complex with glycerophosphates. It includes Vitamins B_1, B_2, B_6 with the filtrate factor, nicotinic acid and other *natural* factors of the entire B-complex. In pints and gallons.

Cremo-Carbonates
An antacid widely used in small-animal practice because of its rapid acid-neutralizing power—due to extremely fine subdivision of magnesium and calcium carbonates and bismuth subcarbonate. Twelve-ounce bottles.

Canine 'Crystoids' Anthelmintic
A safe single-dose anthelmintic 90 to 100% effective against both round worms and hookworms, as definitely proven in group studies. The worms do not migrate. Order the economical twenty-vial package.

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This unique antiseptic is ideally suited for small-animal practice. Non-toxic, odorless, germicidal in the presence of blood serum, mildly astringent and analgesic. Not a mercurial. In five-ounce and twelve-ounce bottles.

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"Poultry Information—Please" was presented by the Poultry Committee of the U. S. Live Stock Sanitary Association at that organization's forty-fourth annual meeting (Chicago, December 4-6, 1940) as a symposium on diseases of chickens and turkeys. By special arrangement the published proceedings of this symposium have been reprinted in pamphlet form, comprising 42 pages of discussions of bacterial, virus, nutritional and parasitic diseases.

Copies of this document are available at 15 cents each, postpaid. Orders should be sent on the coupon provided below to the American Veterinary Medical Association, 600 S. Michigan Ave., Chicago, Ill.

A limited number of USDA Publication No. 300, "The National Poultry Improvement Plan," (price 10 cents) are on hand and will be supplied, while they last, without extra charge with each order for "Poultry Information—Please."

Send ..... copies of "Poultry Information—Please," for which I enclose $..... [Stamps acceptable in amounts under $1.00.]

Name .....

Address .....
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(Town) (State)

An' Related Topics

(Continued from page xxiv)

Food and Animals in the Defense Program

The animal and food supply of the United States is gratifying—larger than last year, and there are surplus stocks to carry over for 1942. Prices of farm products are 36 per cent higher than in 1937 and a 2 billion dollar increase of the nation's food bill is expected for 1941. On 65 major food products the average rise in price is 10 per cent. Coffee and lard have advanced 70 per cent and eggs 63 per cent, wholesale. The rise in prices in the face of surpluses would be a paradox but for the spending of more money for food due to increased earnings and the $1,350,000,000 allotted for food for Britain under the lend-lease program. The nation's income has risen to 90 billion dollars.

The meat supply is 20 million pounds greater than last year, although the pork supply is somewhat less. The production of dairy products for 1941 is expected to be the highest on record, and there has been an increase of fats and oil amounting to 63 million pounds in spite of lower imports of these types of foods.

One of the present marvels in the nation's food program is the 700 million pounds of quick-frozen food (poultry, meat, sea food, vegetables) packed this year, which is a 30 to 40 per cent increase over 1940.

On January 1, 1941, there were in the United States approximately 15,500,000 horses and mules, valued at considerably more than 1 billion dollars. The number is believed to be sufficient to meet any emergency that may arise.

Our small profession can point proudly to the part it plays in this tremendous undertaking.

The interest in obedience tests at certain dog shows has increased to such an extent that bleachers are provided for the spectators in lieu of just gathering around the ring.

(Continued on page xxviii)

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An' Related Topics

(Continued from page xxvi)

From a British Colleague

"I thank you sincerely for your kind offer to continue sending me the JOURNAL in spite of the difficulty I have had in remitting my dues, as stated in your letter of July 16, received today.

"However, I hope you have by this time received my subscription from the British treasury, who agreed to release sufficient funds for the purpose and debited my bank balance accordingly.

"I shall be grateful to avail myself of your offer to replace a JOURNAL apparently lost by enemy action. All of the other issues, except that of November 1940, repose on my shelves undamaged, so far, though we have had a bomb or two in the village, happily with no loss of life."

G. S. MUIR, *Greenmount, Needham Market, Suffolk.*
August 21, 1941.

Indict the Packers?

The buying of hogs in the country is the most controversial question affecting farmers in two decades, says *Successful Farming*. The quarrel among packers, shipping associations, commission firms, stockyards companies, terminal coöperatives and even congressmen is a heated battle born of smooth highways and fast-running trucks. The usual way to set things right when times change things like this is to indict the Chicago packers, who have done more to build up America's livestock wealth than all other agencies combined.

From the early days of the Armour's, the Swift's, the Cudahy's, the Morris's, up

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to the present day, the packers have been the meal ticket of the American stockman, and what they and the commission firms did in building up a great livestock industry in the great big West seems to have been forgotten. All of the while, it has been a great pastime for the federal government to "indict the packers."

About 50 per cent of all the hogs, 25 per cent of the cattle, 40 per cent of the calves, and 36 per cent of the sheep and lambs that are inspected at packing houses by the meat-inspection service of the U. S. Bureau of Animal Industry arrive in trucks, according to figures published in the October 1941 issue of *Successful Farming*. Small packing houses have sprung up like mushrooms in the Midwest, and the farmers are in Congress trying to stop the big packers from buying direct, this farmers' spokesman says. It's not easy for the outsider to comprehend.

Horse Doctors and Fees

New Zealand is considering a law limiting doctors' fees to a dollar and two bits a call. The sequel, says the *Chicago Daily News*, will be a medical profession manned by bargain-counter docs. "We trust [*sic*]," the *C.D.N.* goes on to say, "that there will be enough horse doctors to take care of the asinine population." Since the making of "horse doctors" in New Zealand is quite a long process and the fees they charge are commensurate with services performed, *vox pop.* is barking up the wrong tree for medical help.

A Persian cat taken from San Diego, Calif., to Phoenix, Ariz., a distance of 380 miles, returned home after 14 months. How he crossed the Colorado River and the blistering desert is a mystery.—*From Our Dumb Animals.*

Man unknowingly has achieved perpetual motion. He raises plants to feed to animals, eats the animals and then goes about the business of raising more plants to feed more animals to eat . . . and so on, *ad infinitum*.

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In most cases it becomes necessary to protect cattle at the time of, or immediately after, shipment. For this the agent recommended is

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